M00146.AR.005787
MCAS CHERRY POINT
5090.3a

ADDITIONAL SITE ASSESSMENT BUILDING 3213 WITH TRANSMITTAL MCAS CHERRY POINT NC

1/31/2001

CATLIN ENGINEERS AND SCIENTISTS

CATLIN LAW

ENVIRONMENTAL AND
ENGINEERING CONSULTANTS

WILMINGTON, N.C.
RALEIGH, N.C.

ADDITIONAL SITE ASSESSMENT

BARGE OFFLOAD AREA (BUILDING 3213)

MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

January 31, 2001

CONTRACT No. N62470-95-D-6009
DELIVERY ORDER No. 0112
CATLIN PROJECT No. 200-177

PREPARED BY:
CATLIN Engineers and Scientists
WILMINGTON, NORTH CAROLINA

CATLIN
ENGINEERS and SCIENTISTS

220 Old Dairy Road • P.O. Box 10279
Wilmington, North Carolina 28405
Telephone: (910) 452-5861
Fax: (910) 452-7563

January 31, 2001

Commander
LANTNAVFACENGCOM
Attn: Charles R. Hilton
Code 18211
1510 Gilbert Street
Norfolk, Virginia 23511-2699

RE: Contract No. N62470-95-D-6009
Delivery Order No. 0112
CATLIN Project No. 200-177-20

Dear Mr. Hilton:

Please find enclosed the FINAL report, "Additional Site Assessment – Barge Offload Area (Building 3213), MCAS, Cherry Point, North Carolina." One copy of the final report is included for your files.

The attached page contains a written response to comments concerning the above referenced report.

If you have any questions or require any additional information, please do not hesitate to contact us at (910) 452-5861. CATLIN appreciates the opportunity to provide you with environmental services.

Sincerely,

Thomas W. Landis
Project Geologist

Teri M. Piver
Project Manager

TWL/TMP/ss

Enclosure

cc: John Myers, MCAS EAD (w/1 encl.)
Christine Foskey, LANTNAVFACENGCOM, Code 02134 (letter only)

200177twl02_ltr

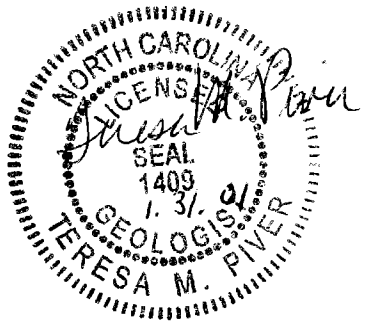
ADDITIONAL SITE ASSESSMENT

BARGE OFFLOAD AREA (BUILDING 3213)

MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ISSUED JANUARY 31, 2001

Contract No. N62470-D-95-6009
Delivery Order No. 0112
CATLIN Engineers and Scientists Project No. 200-177-20



Prepared by:

CATLIN Engineers and Scientists
220 Old Dairy Road
Wilmington, North Carolina 28405
(910) 452-5861

TABLE OF CONTENTS

TABLES

TABLE OF CONTENTS (continued)

FIGURES

APPENDICES

LIST OF ACRONYMS

2L GWQS	NCAC T15A:02L Groundwater Quality Standards
AS	Air Sparge
AST	Aboveground Storage Tank
BDL	Below Detection Limit
BN	Base/Neutral (extractables)
BNA	Base/Neutral/Acid (extractables)
BQL	Below Quantitation Limit
BLS	Below Land Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAP	Corrective Action Plan
CATLIN	CATLIN Engineers and Scientists (Formerly RC&A)
CFR	**C**ode of **F**ederal **R**egulations
Cr	Chromium
CSA	Comprehensive Site Assessment
CNP	Carbon Nitrogen Phosphorous
CPT	Cone Pentrometer Test
DEM	Division of Environmental Management
DIPE	Diisopropyl Ether
DO	Dissolved Oxygen
DOD	**D**epartment **o**f **D**efense
DPT	Direct Push Technology
DWQ	Division of Water Quality
DWM	Division of Waste Management
DTW	Depth to Water
EAD	Environmental Affairs Division
EDB	Ethylene di-bromide
EPA	Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
Fe	Iron
FID	Flame Ionization Detector
FOD	Foreign Object Debris
FT	Feet
GCL	Gross Contaminant Level
GIS	Geographic Information System
GPS	Global Positioning System

LIST OF ACRONYMS (continued)

Guidelines	Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume II, Petroleum Underground Storage Tanks (January 2, 1998)
HDPE	High Density Polyethylene
I/C	Industrial/Commercial
ID	Identification
IGWQS	Interim Ground Water Quality Standards
IPE	Isopropyl ether
LANTDIV	Atlantic Division
LSA	**L**imited **S**ite **A**ssessment
LUST	Leaking Underground Storage Tank
m	meta
m	meter
MADEP	Massachusetts Department of Environmental Protection
MCAS	**M**arine **C**orps **A**ir **S**tation
MCOLF	Marine Corps Outlying Airfield
MDL	Method Detection Limit
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Litre
MSCC	Maximum Soil Contaminant Concentration
MSL	Mean Sea Level
MTBE	Methyl tertiary butyl ether
MWSS	Marine Wing Support Squadron
µg/Kg	Micrograms per Kilogram
µg/L	Micrograms per Litre
NC	**N**orth **C**arolina
NCAC	North Carolina Administrative Code
NCDENR	**N**orth **C**arolina **D**epartment of **E**nvironment and **N**atural **R**esources
NCDOC	North Carolina Department of Corrections
NCDOT	North Carolina Department of Transportation
NCSP	North Carolina State Plane
NCSPA	North Carolina State Ports Authority
NE	None Established
NA	Not Applicable
NMT	No Measurable Thickness
o	ortho
OVA	Organic Vapor Analyzer

LIST OF ACRONYMS (continued)

p	para
PAH	Polynuclear Aromatic Hydrocarbons
Pb	Lead
PPB	Parts Per Billion
PPM	Parts Per Million
PID	Photo Ionization Detector
PQL	Practical Quantitation Limit
PVC	Polyvinyl chloride
RaRO	Raleigh Regional Office
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
Res	Residential
ROI	Radius of Influence
SOW	Scope of Work
STGW	Soil-to-Ground Water
SVE	Soil Vapor Extraction
SVOC	Semi Volatile Organic Compound
TAFDS	Tactical Aviation Fuel Distribution System
TDHF	Toxicologically Defined Hydrocarbons Fractions
TCLP	Toxicity Characteristic Leaching Procedure
TIC	Tentatively Identified Compound
TKN	Total Kjeldahl Nitrogen
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
US	United States
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Society
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons
WaRO	Washington Regional Office
WiRO	Wilmington Regional Office
WSRO	Winston-Salem Regional Office

ADDITIONAL SITE ASSESSMENT

BARGE OFFLOAD AREA (BUILDING 3213)

1.0 EXECUTIVE SUMMARY

The purpose of this Additional Site Assessment was to confirm and delineate or refute the presence of vadose zone soil contamination previously identified at the Barge Offload Site, aboard Marine Corps Air Station, Cherry Point, North Carolina.

During the CSA investigation, soil petroleum contamination in excess of State Action Levels was identified in the vicinity of monitoring well 41GW51 and soil boring SB6. In response to these findings the current additional soil sampling was initiated.

As part of this investigation a total of 10 soil samples were collected from five hand augered soil borings (SB-8 through SB-12). Borings were placed in the previously identified areas of suspected contamination. After field screening, two intervals were chosen from each boring location for analysis by the off-site laboratory.

Vadose zone soil contamination was not confirmed or identified in any of the samples collected as part of this investigation. Review of the previous CSA assessment data indicate the soil samples from 41GW51 and SB6 may have been collected just below the vadose zone. The depth of these original samples may account for the difference in concentrations observed during the CSA investigation and the results of the current sampling event which reports all analyzed samples as Below Laboratory Quantitation Limits.

ADDITIONAL SITE ASSESSMENT
BARGE OFFLOAD AREA (BUILDING 3213)
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

JANUARY 31, 2001

2.0 INTRODUCTION

2.1 Authorization

CATLIN Engineers and Scientists was authorized to perform this Additional Site Assessment by the LANTDIV NAFACENGCOM in accordance with the Order of Supplies Contract No. N62470-95-D-6009, Delivery Order No. 0112.

2.2 Purpose of Investigation
(Refer to Figures 1 and 2)

The purpose of this Additional Site Assessment was to confirm and delineate or refute the presence of vadose zone soil contamination previously identified at the Barge Offload Site, aboard Marine Corps Air Station, Cherry Point, North Carolina. The previously identified soil contamination was reported in the area of soil boring SB-6 and monitoring well 41GW51 which were installed as part of the 1995 CSA investigation.

2.3 Scope of Work

Prior to commencement of field activities existing data from the previous CSA investigation (CATLIN, 1996), was reviewed to assist in the location of sampling points. Three soil borings (SB-8, SB-9, and SB-10) were advanced by hand auger in the vicinity of the previously installed boring SB-6. Two additional soil borings, (SB-11 and SB-12), were also advanced by hand auger in close proximity to monitoring well 41GW51. Monitoring well 41GW51 and soil boring SB-6 were utilized during the previously completed CSA investigation. These two areas were the only locations where vadose zone soil contamination was previously identified at the site.

2.4 Area of Investigation
(Refer to Figures 1 and 2)

The site is located at the Barge Off Load Area near Buildings 3210 and 3211 aboard the MCAS, Cherry Point, North Carolina between Roosevelt Boulevard and Hancock Creek. The area was previously used for the Off Loading of JP-5 fuel from Marine Corps barges. The site is located directly beside Hancock Creek (see Figure 1). To the north of the subject site is Tank Farm F and an abandoned 10-inch diameter underground aviation fuel pipeline. To the east of Tank Farm F are two

fuel dispensers with underground fuel dispensing piping, and to the north are aboveground storage tanks (ASTs) 1256 and 1257. A wooded area lies to the west of the subject site.

The additional soil sampling performed during this investigation was limited to the areas previously discussed where vadose zone soil contamination was previously identified.

3.0 SITE HISTORY AND SOURCE CHARACTERIZATION

3.1 Site History and Operations

The site is known as the Barge Off Load Area and was previously used for the Off Loading of JP-5 fuel from Marine Corps barges. The focus of this investigation is limited to the area of suspected vadose zone soil contamination previously identified during the completion of the CSA for the site. The underground 10-inch diameter pipeline associated with Tank Farm F was reportedly installed in 1946 and used to transport various types of aviation fuel from the fuel docks in Hancock Creek to the airfield's bulk storage facilities. According to Law Engineering and Environmental Services, Inc. (LAW) (1995), leaks have occurred previously at various locations along the entire length of the pipeline. The pipeline was closed in January 1993 due to two leaks located near Building 1083 and the Navy Boat Docks. A total of 65,871 gallons of fuel was drained from the pipeline in July and August 1994. The pipeline is currently inactive.

In addition, two active ASTs (1256 - Diesel and 1257 - Gasoline) and associated piping are located within the immediate vicinity of the project area. The installation dates of the ASTs are not known. According to Fuel Farm Operations personnel, the two ASTs replace an AST formerly located in the vicinity of the dispensers.

3.2 Contaminant Source Inventory

Fifteen potential sources for subsurface impact were identified at the Barge Off Load Area during site reconnaissance. Subsequently, a re-evaluation of the 15 potential sources and research of previous investigations revealed only four potential sources which may impact the subject site. Additional sources may exist in the area that are not identified here. Potential sources (PS) are listed in Table 2.1 and are illustrated in Figure 2.1 of the previously submitted CSA. All potential source locations are approximate.

Potential sources in the vicinity of the Barge Off Load Area are:

PS #1 - Two active ASTs and their associated piping (including abandoned piping) and fuel dispensers located at the Navy boat docks. AST 1256 has a 5,000-gallon capacity and is used for diesel storage. AST 1257 has a 3,000-gallon capacity and is used for gasoline storage. Installation dates are unknown by MCAS EAD.

PS #2 - Tank Farm F, an aviation bulk fuel pumping facility and the associated 10-inch diameter underground aviation fuel distribution pipeline. This pipeline parallels Roosevelt Boulevard from the north end of the Barge Off Load Area to Tank Farm B. The pipeline is currently inactive. According to previous reports several leaks have occurred along the entire length of the pipeline.

PS #3 - Building 3218, a paint shed located to the northeast of the subject site.

PS #4 - Building 3965, a hazardous waste accumulation area, also located northeast of the subject site.

3.3 Release Incident History

The Barge Off Load Area was previously used for the Off Loading of JP-5 fuel from Marine Corps barges located at the Navy boat docks. Tank Farm F and the abandoned 10-inch diameter underground aviation fuel pipeline are located upgradient of the subject site. According to LAW (1995), leaks have occurred previously at various locations along the entire length of the pipeline. The pipeline was closed in January 1993 due to two leaks located near Building 1083 and the Navy Boat Docks. A total of 65,871 gallons of fuel were drained from the pipeline in July and August 1994. In late June 1995, a fuel sheen was identified on several occasions on the waters of Hancock Creek in the vicinity of the Barge Off Load Area and the Navy Boat Docks refueling station. Currently, the pipeline is inactive.

There was no information regarding release incident(s) for ASTs 1256 and 1257. However, during pressure testing of the AST supply lines, "abandoned" piping in the area was documented. It was suggested in the line tightness test report (Facilities Engineering Department, June 1995) that the presence of the abandoned lines may indicate a past problem with the AST system.

3.4 Previous Investigations

Past documents revealed that on May 5, 1986 a leak from a 10-inch diameter underground fuel pipeline was detected approximately 2,000 feet northwest from the Barge Off Load Area. The release area is referred to as the Navy Boat Docks. Subsequently, LANTDIV NAVFACENGCOM contracted with LAW to conduct CSA and Addendum assessment activities during September 1993 and July 1994, respectively. The first stage (September 1993) of the LAW investigation involved Hydropunch ground water sampling and the advancement of 14 soil borings into which 12 Type II and two Type III monitoring wells were installed. The second stage (July 1994) of the LAW investigation included the resampling of six monitoring wells and the advancement of 12 soil borings to collect additional soil and ground water samples for laboratory analysis.

All soil samples were analyzed for total petroleum hydrocarbons (TPH) per EPA Method 5030/3550, flashpoint, and pH. All ground water samples were analyzed for polynuclear aromatic hydrocarbons (PAH) per EPA Method 610 and purgeable aromatics per EPA Method 602. Petroleum hydrocarbon concentrations exceeding the regulatory standard were detected within the soil and ground water on-site. The contaminant plume was delineated and appeared to be in the vicinity of the pipeline leak. No measurable free product was identified; however, a sheen and odor was observed in ground water collected from Type II well 41GW11, which is located adjacent to the fuel release.

On January 22, 1993, another leak was detected from the 10-inch diameter underground fuel pipeline near Building 1083, which is also located approximately 2,500 feet northwest from the Barge Off Load Area. Groundwater Technology Incorporated (GTI) installed five Type II monitoring wells in the immediate vicinity of the pipeline leak in June of 1993. GTI's investigation revealed the presence of soil contamination and dissolved and free phase ground water contamination.

Subsequently, LAW performed a CSA that involved the advancement of 23 Hydropunch sampling probes and 16 soil borings into which 12 Type II and three Type III monitoring wells, and one pumping well were installed. Results of this initial study indicated that the pipeline leak was larger than originally estimated. Therefore, LAW performed an addendum assessment in the same area to characterize the extent of soil and ground water contamination.

Addendum activities included the advancement of 19 soil borings and 24 Hydropunches and the installation of eight Type II monitoring wells and two pumping wells. Soil samples collected from the soil borings and ground water samples were collected from the Hydropunches and the new and existing monitoring wells. In addition, nine surface water and sediment samples were collected to determine if contaminated ground water was discharging into nearby streams and tributaries of the Neuse River.

Soil and sediment samples were analyzed for TPH per EPA Method 5030/3550 and oil & grease per EPA Method 9071. Ground water and surface water samples were analyzed for PAHs per EPA Method 610 and purgeable aromatics per EPA Method 602. Results of the soil and ground water analysis revealed petroleum hydrocarbon concentrations at levels exceeding regulatory standards. Free product was detected in 11 monitoring wells located within approximately 73 feet of the pipeline leak site.

In late June of 1995, a fuel sheen was identified on the waters of Hancock Creek in the vicinity of the Barge Off Load Area and the Navy Boat Docks refueling station. Subsequently, a hydrostatic pressure tightness test was conducted by the Facility's Engineering Department on underground fuel supply lines from the diesel aboveground storage tanks (ASTs 1256 and 1257) to the dispenser pumps located on the edge of Hancock Creek. The underground piping was noted as in good condition. It was also documented in the report that there appeared to be abandoned

piping in the area. Maintenance personnel confirmed that the original piping was abandoned in place and replaced in 1990 with the current piping system.

From 1400 July 17, 1995 to 0930 July 18, 1995, air pressure of 50 psi was applied to the piping systems for 19.5 hours. No pressure was lost from the piping during the hydrostatic pressure test. Therefore, the fuel piping system was determined to be tight and recommended to be placed back in operation.

The basis of the 1996 CATLIN CSA investigation was the occasional apparent fuel sheen observed in front of the Barge Off Load Area on the waters of Hancock Creek in relation to the abandoned 10-inch diameter underground aviation fuel pipeline. The fuel sheen was first reported in late June of 1995.

As part of this investigation, CATLIN performed six Hydropunches and seven soil borings, and installed one Type I monitoring well, 11 Type II monitoring wells, two Type III monitoring wells, and one pumping test well to determine site geology and the extent of impact to subsurface soils and ground water. Depth to ground water beneath the site was found to range between approximately two to nine feet. Ground water flow direction at the site was found to generally flow predominantly towards the southeast with an average linear velocity of 4.33 feet per day. Geology beneath the site consists of organic-rich, very fine to fine-grained sands, silty sand, sand silt-clay mixtures with shell fragments and limestone.

Contamination was identified in excess of State action levels within the vadose zone (soil) at the Barge Off Load Area. The approximate areas of soil contamination were identified in the vicinity of well 41GW51 and soil boring SB6. Neither free product nor a ground water contaminant plume was identified at the Barge Off Load Area. Concentrations of total lead and chloroform were identified in excess of the State ground water quality standard. However, the concentrations of these compounds do not correlate with any identifiable potential source of soil and/or ground water (petroleum compounds) contamination.

The source for the fuel sheen was not positively identified during the CSA investigation. It was recommended that additional hand auger and/or soil borings be installed around areas of known soil contamination. Additional data points were recommended in the area of well 41GW51 to better define the soil contaminant plume dimensions. Soil samples were also recommended to be collected in the vicinity of SB6 to confirm that contaminant concentrations are less than the final cleanup level determined from the Site Sensitivity Evaluation. In addition, the utilization of Hydropunches or direct push technology was recommended in the vicinity of the fuel dispensers to better identify the source of the fuel sheen. Sorbent booms may be necessary in the area of the fuel sheen to minimize impact to Hancock Creek. Remediation strategies should be developed when the origin or source of the fuel sheen has been identified and the release halted.

In response to the CSA recommendations the current additional sampling was initiated and completed.

4.0 SOIL INVESTIGATION

4.1 Site Topography

The project area is dominated by sloping topography towards Hancock Creek. Hancock Creek is located directly south of the subject site. Surface runoff from the site flows south in the direction of Hancock Creek.

4.2 Regional Geology

The area of investigation lies within the Coastal Plain Physiographic province. The North Carolina Coastal Plain is approximately 90 to 150 miles wide from the Atlantic Ocean westward to its boundary with the Piedmont Province. Two natural subdivisions of the Coastal Plain were described by Stuckey (1965): the Tidewater region and the Inner Coastal Plain. The project area is located on the boundary of the Tidewater region which consists of the coastal area where large streams and many of their tributaries are affected by ocean tides (Winner, Jr., and Coble, 1989).

The Coastal Plain is comprised of a wedge shaped sequence of stratified marine and non-marine sedimentary rocks deposited on crystalline basement rocks. Sedimentary sequences in the Cherry Point area range in age from Cretaceous to Post-Pliocene occurring as discontinuous and interfingering beds and lenses that thicken southeastward (Eimers, et al, 1994).

The surficial Quaternary age deposits are underlain by Tertiary age rock units consisting of the Yorktown Formation, Pungo River Formation, and the Upper and Lower Castle Hayne Formation followed by the Beaufort Formation. Underlying Cretaceous age rocks include the Peedee, Black Creek and the Upper and Lower Cape Fear Formations (Eimers, et al, 1994).

Review of well information from Eimers, et all (1994) identified Well No. 11 at the Marine Corps Air Station, Cherry Point to be closest to the Barge Off Load area. Regional lithological units identified from hydrogeologic data of Well No. 11 were as follows:

FORMATION	DEPTH IN FEET	DESCRIPTION
Quaternary Surficial Deposits	0-50	Sand, clay, gravel, and peat deposits in marine, fluvial, eolian, and lacustrine environments. Quaternary age deposits not shown at altitudes greater than approximately 25 feet above mean sea level.

Tertiary Yorktown	50-91	Fossiliferous clay with varying amounts of fine grained sand, bluish gray, shell material commonly concentrated in lenses; mainly in areas north of the Neuse River.
Tertiary Pungo River	91-140	Clay beds containing less than 10 percent sand. Fine to medium grained marine sand with considerable phosphate content.
Tertiary Castle Hayne	140-683	Upper level molluscan-mold limestone, indurated, very sandy. Grades downward into calcareous sand and laterally into a bryozoan-echinoid skeletal limestone, locally dolomitized, solution cavities common. Lower level phosphate-pebble conglomerates, micritic, thin; restricted to basal part of the Castle Hayne Formation in southeastern counties.
Tertiary Beaufort	683-760	Upper level sand and silty clay, glauconitic, fossiliferous, and locally calcareous. Lower level siliceous mudstone with sandstone lenses; thin bedded, basal phosphatic pebble conglomerates (NCDNRCD, 1985).

4.3 Site Soils and Geology

4.3.1 Soil Boring Installation (Refer to Figure 2)

Prior to the advancement of the most recent soil borings, a through review of the previous assessment activities was utilized to aid in placement of sample locations.

A total of five soil borings (SB-8 through SB-12) were advanced by hand auger to the interface of the shallow water table. Three of the soil borings were located in the vicinity of the previously installed soil boring SB-6. The remaining two soil borings were located in the vicinity of the previously constructed monitoring well 41GW51. Boring locations are shown on Figure 2.

4.3.2 Description of Subsurface Samples (Refer to Appendix A, and Figures 2 through 6)

Soil samples were obtained in one-foot intervals from land surface until the shallow water table was encountered. Soils were described in the field by a geologist or engineer trained in using visual/manual techniques as described in ASTM D-2487 and D-2488. The soils were classified in accordance with the Unified Soils Classification System (USCS) and a boring record of each borehole was produced. Boring logs are provided in Appendix A.

4.4 Soil Sampling Results

4.4.1 Field Screening and Laboratory Sample Collection

Field screening was conducted during advancement of the soil borings to determine if organic vapors were present in the unsaturated zone and to identify areas of suspected near-surface releases.

Each one-foot increment was divided, and placed in two pre-labeled, air tight, plastic bags. One sample bag was immediately placed on ice pending selection of the appropriate laboratory sample depth. The second sample bag was left undisturbed for several minutes to allow the organic vapors to reach equilibrium. The gas contained in the headspace of the bag was tested with an Organic Vapor Analyzer (OVA) flame-ionization detector. Laboratory samples for each borehole were taken from the one-foot increment registering the highest OVA reading and from the increment just above the water table. All of the laboratory soil samples for this investigation were sent to the off-site laboratory for analysis.

All soil samples collected for laboratory analyses were immediately placed on ice. Soil was collected and placed into containers in accordance with the type of analyses scheduled for that sample as follows:

Analytical Method	Bottle Type and Size	Total Number of Bottles per Sample, Off-Site Lab	Preservative
TPH-EPA Methods 5030/3550	Clear Glass Wide Mouth/8 oz.	2	<4°C
EPA Method 8015B	Clear Glass Wide Mouth/8 oz.	2	<4°C
BNA Semi-Volatiles EPA Method 8270	Clear Glass Wide Mouth/8 oz.	2	<4°C
Volatiles EPA Method 8260	Clear Glass Wide Mouth/8 oz.	2	<4°C
Alphatics/Aromatics MADEP VPH/EPH	VOAs	6	<4°C/Methanol (VPH only)

4.4.2 Results of Soil Analyses (Refer to Table 1)

4.4.2.1 Field Screening

Results of the field screening using the OVA are provided in Table 1. Organic vapor recordings ranged from less than one to greater than 20 ppm. There appears to be minimal correlation between field screening and soil analyses results.

4.4.3 Soil Sampling Laboratory Results
(Refer to Tables 2 through 6, Figures 3 through 6, and Appendix B)

4.4.3.1 EPA Methods 5030/3550 for TPH-Soil
(Refer to Table 2, Figure 3 and Appendix B)

A total of 10 soil samples were collected from five boring locations and submitted to the laboratory for analysis. No samples revealed TPH concentrations above the PQLs for Gasoline or Diesel range compounds.

4.4.3.2 EPA Method 8270 for BNA Semivolatiles – Soil
(Refer to Table 3, Figure 4 and Appendix B)

Semivolatile analysis revealed no detectable concentrations of 8270 list compounds; therefore, all list compounds were reported as BQL.

4.4.3.3 EPA Method 8260 for Volatiles – Soil
(Refer to Table 4, Figure 5 and Appendix B)

No concentrations of 8260 list compounds were detected above PQLs for any of the samples analyzed and were therefore reported as BQL in all instances.

4.4.3.4 MADEP VPH/EPH for Aliphatics/Aromatics - Soil
(Refer to Table 5, Table 6, Figure 6 and Appendix B)

Laboratory analyses revealed that all site soil samples tested were below PQLs for all Aliphatic/Aromatic fractions analyzed.

5.0 GROUND WATER INVESTIGATION

No ground water samples were collected as part of this Additional Assessment Investigation.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Vadose zone soil petroleum contamination was not confirmed or identified during this investigation. Review of the previous CSA assessment data indicates the soil sample for 41GW51 and SB-6 may have been collected just below the vadose zone. The deeper depth of these original soil samples may account for the difference in concentrations observed during the CSA investigation and the results of the current sampling event. Supported by the lack of any reportable concentrations of analytes from the various compound lists analyzed as part of this investigation, no additional soil sampling is recommended at this time. Furthermore, it is recommended that a copy of this report be provided to the NCDENR – Washington Regional Office.

7.0 REFERENCES

CATLIN Engineers and Scientists, 1996, Comprehensive Site Assessment, Barge Off Load Area (Building 3213), Marine Corps Air Station, Cherry Point, North Carolina.

Facilities Engineering Department, June 27, 1995, (Unpublished), Tightness Testing of Fuel Lines, Gasoline and Diesel Dispensing Systems, Navy Boat Dock Facilities, MCAS, Cherry Point, North Carolina.

Facilities Engineering Department, July 17, 1995, (Unpublished), Management Overview of Storage Tanks in the Navy Boat Docks Area, MCAS, Cherry Point, North Carolina.

Law Engineering, January 3, 1995, Addendum Leaking Pipeline Assessment Report, Volume I, Fuel Docks Pipeline, Marine Corps Air Station, Cherry Point, North Carolina.

Law Engineering, February 1995, Addendum Leaking Pipeline Assessment Report, Volume I, Building 1083 Pipeline, Marine Corps Air Station, Cherry Point, North Carolina.

North Carolina Department of Environment, Health, & Natural Resources (NCDEHNR), January 1998, Groundwater Section Guidelines for the Investigation and Remediation of Soils and Groundwater, 95 pp.

North Carolina Department of Natural Resources and Community Development, 1985, Geologic Map of North Carolina.

Stuckey, J.L., 1965, North Carolina: Its Geology and Mineral Resources: North Carolina Department of Conservation and Development, Raleigh, North Carolina, 550 pp.

Todd, D.K., 1980, Groundwater Hydrology, John Wiley & Sons, New York, 535 pp.

Winner, Jr., M.D., and Coble, R.W., 1989, Hydrogeologic Framework of the North Carolina Coastal Plain Aquifer System: U.S. Geological Survey, Open File Report 87-690, 150 pp.

TABLES

TABLE 1

SUMMARY OF SOIL HEADSPACE SCREENING ANALYSIS

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

SAMPLE I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
SB-8	(0-1)	3	
SB-8	(1-2)	1	
SB-8	(2-3)	4	*
SB-8	(3-4)	1	
SB-8	(4-5)	<1	
SB-8	(5-6)	<1	*
SB-9	(0-1)	<1	
SB-9	(1-2)	<1	
SB-9	(2-3)	<1	
SB-9	(3-4)	<1	*
SB-9	(5-6)	<1	*
SB-10	(0-1)	<1	
SB-10	(1-2)	<1	
SB-10	(2-3)	<1	
SB-10	(3-4)	<1	
SB-10	(4-5)	1	*
SB-10	(5-6)	1	*

TABLE 1

SUMMARY OF SOIL HEADSPACE SCREENING ANALYSIS

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

SAMPLE I.D.	Sample Depth (ft.)	OVA READING (ppm)	Sample Selected for Laboratory Analysis
SB-11	(0-1)	<1	
SB-11	(1-2)	<1	
SB-11	(2-3)	1	*
SB-11	(3-4)	<1	*
SB-11	(4-5)	<1	
SB-12	(0-1)	<1	
SB-12	(1-2)	7	
SB-12	(2-3)	20	*
SB-12	(3-4)	10	*

TABLE 2

SUMMARY OF SOIL LABORATORY RESULTS
TOTAL PETROLEUM HYDROCARBONS - EPA METHODS 5030/3550

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

SAMPLE ID	Date	Depth (feet)	TPH-5030 GASOLINE (mg/Kg)	TPH-3550 DIESEL (mg/Kg)
NCDENR ACTION LEVELS			**10**	**40**
SB-8	11/28/00	(2-3)	<7.0	<7.2
SB-8	11/28/00	(5-6)	<7.0	<7.3
SB-9	11/28/00	(3-4)	<6.6	<6.8
SB-9	11/28/00	(5-6)	<6.7	<6.9
SB-10	11/28/00	(4-5)	<6.4	<6.7
SB-10	11/28/00	(5-6)	<6.6	<6.8
SB-11	11/28/00	(2-3)	<7.0	<7.2
SB-11	11/28/00	(3-4)	<7.2	<7.4
SB-12	11/28/00	(2-3)	<6.9	<6.9
SB-12	11/28/00	(3-4)	<6.6	<6.8

TABLE 3

SUMMARY OF SOIL LABORATORY RESULTS
SEMIVOLATILE ORGANIC COMPOUNDS BY GC/MS- EPA METHOD 8270

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification and Date Sampled				
		SB-8 (2-3) 11/28/00	**SB-8 (5-6)** 11/28/00	**SB-9 (3-4)** 11/28/00	**SB-9 (5-6)** 11/28/00	**SB-10 (4-5)** 11/28/00
All 8270 List Compounds	Varies Varies Varies	BQL	BQL	BQL	BQL	BQL

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification and Date Sampled				
		SB-10 (5-6) 11/28/00	**SB-11 (2-3)** 11/28/00	**SB-11 (3-4)** 11/28/00	**SB-12 (2-3)** 11/28/00	**SB-12 (3-4)** 11/28/00
All 8270 List Compounds	Varies Varies Varies	BQL	BQL	BQL	BQL	BQL

TABLE 4

SUMMARY OF SOIL LABORATORY RESULTS
HALOGENATED AND AROMATIC VOLATILES - EPA METHOD 8260B

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification and Date Sampled				
		SB-8 (2-3) 11/28/00	SB-8 (5-6) 11/28/00	SB-9 (3-4) 11/28/00	SB-9 (5-6) 11/28/00	SB-10 (4-5) 11/28/00
All 8260B List Compounds	Varies Varies Varies	BQL	BQL	BQL	BQL	BQL

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification and Date Sampled				
		SB-10 (5-6) 11/28/00	SB-11 (2-3) 11/28/00	SB-11 (3-4) 11/28/00	SB-12 (2-3) 11/28/00	SB-12 (3-4) 11/28/00
All 8260B List Compounds	Varies Varies Varies	BQL	BQL	BQL	BQL	BQL

TABLE 5

SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ANALYTICAL FRACTION	Sample Identification and Date Sampled					
	SB-8 (2-3) 11/28/00	**SB-8 (5-6)** 11/28/00	**SB-9 (3-4)** 11/28/00	**SB-9 (5-6)** 11/28/00	**SB-10 (4-5)** 11/28/00	**SB-10 (5-6)** 11/28/00
VPH (mg/Kg)						
C_5-C_8 Aliphatics	<10	<10	<10	<10	<10	<10
C_9-C_{12} Aliphatics	<10	<10	<10	<10	<10	<10
C_9-C_{10} Aromatics	<10	<10	<10	<10	<10	<10
EPH (mg/Kg)						
C_9-C_{18} Aliphatics	<10	<10	<10	<10	<10	<10
C_{19}-C_{36} Aliphatics	<10	<10	<10	<10	<10	<10
C_{11}-C_{22} Aromatics	<10	<10	<10	<10	<10	<10

TABLE 5

SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ANALYTICAL FRACTION	Sample Identification and Date Sampled					
	SB-11 (2-3) 11/28/00	**SB-11 (3-4)** 11/28/00	**SB-12 (2-3)** 11/28/00	**SB-9 (3-4)** 11/28/00	**Trip Blank** 11/28/00	
VPH (mg/Kg)						
C_5-C_8 Aliphatics	<10	<10	<10	<10	<10	
C_9-C_{12} Aliphatics	<10	<10	<10	<10	<10	
C_9-C_{10} Aromatics	<10	<10	<10	<10	<10	
EPH (mg/Kg)						
C_9-C_{18} Aliphatics	<10	<10	<10	<10	<10	
C_{19}-C_{36} Aliphatics	<10	<10	<10	<10	<10	
C_{11}-C_{22} Aromatics	<10	<10	<10	<10	<10	

TABLE 6

SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR MSCCs

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification and Date Sampled			
			SB-8 (2-3) 11/28/00	SB-8 (5-6) 11/28/00	SB-9 (3-4) 11/28/00	SB-9 (5-6) 11/28/00
C_5-C_8 Aliphatics	C_5-C_8 Aliphatics	939 24,528 72	<10	<10	<10	<10
C_9-C_{12} Aliphatics C_9-C_{18} Aliphatics	C_9-C_{18} Aliphatics	9,386 245,280 3,255	<20	<20	<20	<20
C_{19}-C_{36} Aliphatics	C_{19}-C_{36} Aliphatics	93,860 ----- Health-Based Level (>100%) ----- Considered Immobile	<10	<10	<10	<10
C_9-C_{10} Aromatics C_{11}-C_{22} Aromatics	C_9-C_{22} Aromatics	469 12,264 34	<20	<20	<20	<20

TABLE 6

SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR MSCCs

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification and Date Sampled			
			SB-10 (4-5) 11/28/00	**SB-10 (5-6)** 11/28/00	**SB-11 (2-3)** 11/28/00	**SB-11 (3-4)** 11/28/00
C_5-C_8 Aliphatics	C_5-C_8 Aliphatics	939 24,528 72	<10	<10	<10	<10
C_9-C_{12} Aliphatics C_9-C_{18} Aliphatics	C_9-C_{18} Aliphatics	9,386 245,280 3,255	<20	<20	<20	<20
C_{19}-C_{36} Aliphatics	C_{19}-C_{36} Aliphatics	93,860 ----- Health-Based Level (>100%) ----- Considered Immobile	<10	<10	<10	<10
C_9-C_{10} Aromatics C_{11}-C_{22} Aromatics	C_9-C_{22} Aromatics	469 12,264 34	<20	<20	<20	<20

TABLE 6

SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR MSCCs

BARGE OFF LOAD AREA
MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification and Date Sampled			
			SB-12 (2-3) 11/28/00	SB-12 (3-4) 11/28/00	Trip Blank 11/28/00	
C_5-C_8 Aliphatics	C_5-C_8 Aliphatics	939 24,528 72	<10	<10	<10	
C_9-C_{12} Aliphatics C_9-C_{18} Aliphatics	C_9-C_{18} Aliphatics	9,386 245,280 3,255	<20	<20	<20	
C_{19}-C_{36} Aliphatics	C_{19}-C_{36} Aliphatics	93,860 --- Health-Based Level (>100%) --- Considered Immobile	<10	<10	<10	
C_9-C_{10} Aromatics C_{11}-C_{22} Aromatics	C_9-C_{22} Aromatics	469 12,264 34	<20	<20	<20	

FIGURES

2000 1000 0 2000

SCALE IN FEET

FROM: USGS CHERRY POINT, N.C. TOPOGRAPHIC QUADRANGLE DATED 1949, (PHOTOREVISED 1983)

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BARGE OFF-LOAD AREA
MCAS CHERRY POINT
CHERRY POINT, N.C.

TITLE: GENERAL LOCATION
USGS TOPOGRAPHIC QUADRANGLE

FIGURE 1

JOB NO: 200177-20 | DATE: DEC 2000 | SCALE: 1"=2000' | DRAWN BY: WHW | CHECKED BY: TWL

200177-20-F01

NOTES:
1. STRUCTURE LOCATIONS ARE APPROXIMATE AND ARE FROM AUTOCAD DATA BASE FURNISHED BY CHERRY POINT ENGINEERING OFFICE.
2. BORINGS SB-8 THROUGH SB-12 WERE COLLECTED BY ***CATLIN***, NOVEMBER 2000. ALL OTHER SAMPLE LOCATIONS SHOWN WERE PART OF PREVIOUS SITE ASSESSMENT ACTIVITIES.

LEGEND

EXISTING	DESCRIPTION
	BUILDING
	AREA WHERE A SHEEN HAS BEEN OBSERVED
	TYPE I WELL
	HYDROPUNCH
	TYPE II WELL
	TYPE III WELL
	PUMPING WELL
	BORING

N

(LOCATION OF ABANDONED 10" FUEL PIPELINE)

ROOSEVELT BOULEVARD

BM FH36 EL. 11.74

41GW52

HP3

WOODS

AST 1257

AST 1256

CURB

SB-8

SB6

HP2

41GW47

3964

HP4

SB-9

41GW59

41GW48

41GW61

SB-10

(FUEL LINE)

3208

41GW58

SB7

41GW57

41GW51

SB-12

SB-11

HP5

FENCE

TANK FARM "F"

GATE

41GW53

41GW56

3210

3211

3212

HP6

SB2

CURB

SB1

SB3

SB4

3963

41GW50

41GW60

SB5

FORMER 3213

PILINGS

FUEL DISPENSERS

BATTERY STORAGE AREA

FORMER AST

485

FORMER AST

3218

3965

41GW54

UST

1009

41GW55

HP1

ASPHALT

41GW49

470

HANCOCK CREEK

40 0 40
SCALE IN FEET

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BARGE OFF-LOAD AREA MCAS CHERRY POINT CHERRY POINT, N.C.		TITLE: SITE MAP WITH PREVIOUS AND CURRENT SAMPLING LOCATIONS		FIGURE 2
JOB NO. 200177-20	DATE: DEC 2000	SCALE: 1"=40'	DRAWN BY: WHW	CHECKED BY: TWL

200177-20-F02

NOTES:
1. STRUCTURE LOCATIONS ARE APPROXIMATE AND ARE FROM AUTOCAD DATA BASE FURNISHED BY CHERRY POINT ENGINEERING OFFICE.
2. BORINGS SB-8 THROUGH SB-12 WERE COLLECTED BY ***CATLIN***, NOVEMBER 2000. ALL OTHER SAMPLE LOCATIONS SHOWN WERE PART OF PREVIOUS SITE ASSESSMENT ACTIVITIES.
3. CONCENTRATION VALUES ARE IN mg/Kg (ppm)

LEGEND

EXISTING	NEW	DESCRIPTION
		BUILDING
		AREA WHERE A SHEEN HAS BEEN OBSERVED
		TYPE I WELL
		TYPE II WELL
		TYPE III WELL
		PUMPING WELL
		BORING
(/)		TPH 5030/3550 CONCENTRATIONS IN ppm FROM PREVIOUS INVESTIGATIONS
BDL		BELOW DETECTION LIMITS
BQL		BELOW QUANTITATION LIMITS
NS		NOT SAMPLED
<		BELOW REPORTED LABORATORY QUANTITATION LIMITS

N

(LOCATION OF ABANDONED 10" FUEL PIPELINE)

ROOSEVELT BOULEVARD

BM FH36 EL. 11.74

41GW52 (BOL/BDL)

WOODS

(2'-3')	(5'-6')
<7.0	<7.0
<7.2	<7.2

SB-8

SB6

AST 1257

AST 1256

CURB

41GW47 (BOL/BDL)

SB-9

3964

(3'-4')	(5'-6')
<6.6	<6.7
<6.8	<6.9

41GW59 (BOL/BDL)

41GW48 (BOL/194)

41GW61 (NS)

SB-10

(4'-5')	(5'-6')
<6.4	<6.6
<6.7	<6.8

3208

(FUEL LINE)

BATTERY STORAGE AREA

FORMER AST

485

FORMER AST

3218

3965

41GW54 (BOL/BDL)

UST

1009

41GW58 (BOL/BDL)

SB7 (BOL/5.1)

41GW57 (BOL/BDL)

SB-12

(2'-3')	(3'-4')
<6.9	<6.6
<6.9	<6.8

41GW51 (BOL/1,110)

41GW55 (BOL/BDL)

SB-11

(2'-3')	(3'-4')
<7.0	<7.2
<7.2	<7.4

41GW56 (BOL/BDL)

41GW53 (BOL/BDL)

FENCE "F"

GATE

TANK FARM

3210

3211

3212

SB2 (BOL/BDL)

CURB

SB1

WOODS

FORMER 3213

PILINGS

SB3 (BOL/BDL)

SB4 (BOL/BDL)

3963

FUEL DISPENSERS

41GW50 (BOL/BDL)

41GW60 (NS)

SB5 (BOL/BDL)

ASPHALT

41GW49 (BOL/BDL)

470

HANCOCK CREEK

40 0 40
SCALE IN FEET

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BARGE OFF-LOAD AREA
MCAS CHERRY POINT
CHERRY POINT, N.C.

JOB NO. 200177-20 | DATE: DEC 2000

TITLE: TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS
EPA METHODS 5030/3550 - SOIL

SCALE: 1"=40' | DRAWN BY: WHW | CHECKED BY: TWL

FIGURE 3

200177-20-F03

NOTES:

1. STRUCTURE LOCATIONS ARE APPROXIMATE AND ARE FROM AUTOCAD DATA BASE FURNISHED BY CHERRY POINT ENGINEERING OFFICE.
2. BORINGS SB-8 THROUGH SB-12 WERE COLLECTED BY ***CATLIN***, NOVEMBER 2000. ALL OTHER SAMPLE LOCATIONS SHOWN WERE PART OF PREVIOUS SITE ASSESSMENT ACTIVITIES.
3. SOIL SAMPLES COLLECTED FROM PREVIOUS INVESTIGATIONS WERE NOT ANALYZED PER EPA METHOD 8270.
4. CONCENTRATION VALUES ARE IN mg/Kg (ppm).
5. LABORATORY QUANTITATION LIMITS RANGED FROM 0.0055mg/Kg TO 0.12 mg/Kg AND VARY FROM COMPOUND TO COMPOUND.

LEGEND

EXISTING	NEW	DESCRIPTION
		BUILDING
		AREA WHERE A SHEEN HAS BEEN OBSERVED
		TYPE I WELL
		TYPE II WELL
		TYPE III WELL
		PUMPING WELL
		BORING
( )		SAMPLE INTERVAL IN FEET BELOW LAND SURFACE
BQL		BELOW QUANTITATION LIMITS

N

(LOCATION OF ABANDONED 10" FUEL PIPELINE)

ROOSEVELT BOULEVARD

BM FH36 EL. 11.74

41GW52

WOODS

(2'-3') BQL | (5'-6') BQL

SB-8

SB6

AST 1257

AST 1256

CURB

41GW47

SB-9

(3'-4') BQL | (5'-6') BQL

41GW59

41GW48

41GW61

SB-10

(4'-5') BQL | (5'-6') BQL

3964

3208

(FUEL LINE)

BATTERY STORAGE AREA

FORMER AST

485

FORMER AST

3218

3965

41GW54

UST

1009

41GW58

SB7

41GW57

41GW51

SB-12

(2'-3') BQL | (3'-4') BQL

41GW55

SB-11

(2'-3') BQL | (3'-4') BQL

41GW53

FENCE

TANK FARM "F"

GATE

41GW56

3210

3211

3212

SB2

CURB

SB1

SB3

SB4

3963

41GW50

41GW60

SB5

FORMER 3213

PILINGS

FUEL DISPENSERS

ASPHALT

470

41GW49

WOODS

HANCOCK CREEK

40 0 40
SCALE IN FEET

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BARGE OFF-LOAD AREA
MCAS CHERRY POINT
CHERRY POINT, N.C.

TITLE: BNA SEMIVOLATILE CONCENTRATIONS
EPA METHOD 8270 - SOIL

FIGURE 4

JOB NO. 200177-20 | DATE: DEC 2000 | SCALE: 1"=40' | DRAWN BY: WHW | CHECKED BY: TWL

200177-20-F04

NOTES:

1. STRUCTURE LOCATIONS ARE APPROXIMATE AND ARE FROM AUTOCAD DATA BASE FURNISHED BY CHERRY POINT ENGINEERING OFFICE.
2. BORINGS SB-8 THROUGH SB-12 WERE COLLECTED BY ***CATLIN***, NOVEMBER 2000. ALL OTHER SAMPLE LOCATIONS SHOWN WERE PART OF PREVIOUS SITE ASSESSMENT ACTIVITIES.
3. SOIL SAMPLES COLLECTED FROM PREVIOUS INVESTIGATIONS WERE NOT ANALYZED PER EPA METHOD 8260.
4. CONCENTRATION VALUES ARE IN mg/Kg (ppm).
5. LABORATORY QUANTITATION LIMITS RANGED FROM 0.33mg/Kg TO 1.8mg/Kg AND VARY FROM COMPOUND TO COMPOUND.

LEGEND

EXISTING	NEW	DESCRIPTION
		BUILDING
		AREA WHERE A SHEEN HAS BEEN OBSERVED
		TYPE I WELL
		TYPE II WELL
		TYPE III WELL
		PUMPING WELL
		BORING
( )		SAMPLE INTERVAL IN FEET BELOW LAND SURFACE
BQL		BELOW QUANTITATION LIMITS

N

F (LOCATION OF ABANDONED 10" FUEL PIPELINE)

ROOSEVELT BOULEVARD

BM FH36 EL. 11.74

41GW52

WOODS

(2'-3') BQL | (5'-6') BQL

SB-8

SB6

AST 1257

AST 1256

CURB

41GW47

3964

SB-9

(3'-4') BQL | (5'-6') BQL

41GW59

41GW48

41GW61

SB-10

(4'-5') BQL | (5'-6') BQL

3208

(FUEL LINE)

41GW58

SB7

41GW57

41GW51

SB-12

(2'-3') BQL | (3'-4') BQL

SB-11

(2'-3') BQL | (3'-4') BQL

41GW56

41GW53

FENCE

TANK FARM "F"

GATE

3210

3211

3212

SB2

CURB

SB1

FORMER 3213

SB3

SB4

3963

41GW50

41GW60

SB5

PILINGS

FUEL DISPENSERS

WOODS

BATTERY STORAGE AREA

FORMER AST

485

FORMER AST

3218

3965

41GW54

UST

1009

41GW55

ASPHALT

470

41GW49

HANCOCK CREEK

40 0 40

SCALE IN FEET

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BARGE OFF-LOAD AREA
MCAS CHERRY POINT
CHERRY POINT, N.C.

TITLE: VOLATILE CONCENTRATIONS
EPA METHOD 8260 – SOIL

FIGURE 5

JOB NO. 200177-20 | DATE: DEC 2000 | SCALE: 1"=40' | DRAWN BY: WHW | CHECKED BY: TWL

200177-20-F05

NOTES:

1. STRUCTURE LOCATIONS ARE APPROXIMATE AND ARE FROM AUTOCAD DATA BASE FURNISHED BY CHERRY POINT ENGINEERING OFFICE.
2. BORINGS SB-8 THROUGH SB-12 WERE COLLECTED BY ***CATLIN,*** NOVEMBER 2000. ALL OTHER SAMPLE LOCATIONS SHOWN WERE PART OF PREVIOUS SITE ASSESSMENT ACTIVITIES.
3. SOIL SAMPLES COLLECTED FROM PREVIOUS INVESTIGATIONS WERE NOT ANALYZED FOR MADEP VPH/EPH CONCENTRATIONS.

LEGEND

EXISTING	NEW	DESCRIPTION
		BUILDING
		AREA WHERE A SHEEN HAS BEEN OBSERVED
		TYPE I WELL
		TYPE II WELL
		TYPE III WELL
		PUMPING WELL
		BORING
( )		SAMPLE INTERVAL IN FEET BELOW LAND SURFACE
<		BELOW QUANTITATION LIMITS (ANALYTICAL FRACTION COMPOUND QUANTITATION LIMITS VARY)

	ANALYTICAL FRACTIONS (mg/Kg)	TOXICOLOGICALLY DEFINED HYDROCARBON FRACTIONS	MSCC	
1	C5-C8 ALIPHATICS	C5-C8 ALIPHATICS	[1] RESIDENTIAL [2] INDUSTRIAL-COMMERCIAL [3] SOIL TO GROUNDWATER	939 24,528 72
2	C9-C12 ALIPHATICS C9-C18 ALIPHATICS	C9-C18 ALIPHATICS	[1] [2] [3]	9,386 245,280 3,255
3	C19-C36 ALIPHATICS	C19-C36 ALIPHATICS	[1] [2] [3]	93,860 HEALTH-BASED LEVEL(>100%) CONSIDERED IMMOBILE
4	C9-C10 AROMATICS C11-C22 AROMATICS	C9-C22 AROMATICS	[1] [2] [3]	469 12,264 34

	(2'-3')	(5'-6')
1	<10	<10
2	<20	<20
3	<10	<10
4	<20	<20

	(3'-4')	(5'-6')
1	<10	<10
2	<20	<20
3	<10	<10
4	<20	<20

	(4'-5')	(5'-6')
1	<10	<10
2	<20	<20
3	<10	<10
4	<20	<20

	(2'-3')	(3'-4')
1	<10	<10
2	<20	<20
3	<10	<10
4	<20	<20

	(2'-3')	(3'-4')
1	<10	<10
2	<20	<20
3	<10	<10
4	<20	<20

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT	TITLE	FIGURE
BARGE OFF-LOAD AREA MCAS CHERRY POINT CHERRY POINT, N.C.	MADEP VPH/EPH CONCENTRATIONS COMPARED TO DENR MSCC's – SOIL	6

JOB NO. 200177-20 | DATE: DEC 2000 | SCALE: 1"=40' | DRAWN BY: WHW | CHECKED BY: TWL

200177-20-F06

APPENDICES

APPENDIX A

SOIL TEST BORING RECORDS

BORING LOG

BORING NUMBER SB-8 **SITE LOCATION** Barge Offload Area **DRILLED BY** TWL
TOTAL DEPTH 6' MCAS Cherry Point, North Carolina **LOGGED BY** JAC

DRILLING DATE 11/28/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USGS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	1	Fine grained silty SAND with some organic SILTs/poorly sorted/medium dense/light brown-olive gray	SM	Slightly Moist	None	3	DPT
1	2	Fine grained silty SAND with some silty CLAY/ soft/low plasticity/yellowish orange-olive gray	SC	Slightly Moist	None	1	DPT
2	3	Inorganic silty CLAY with fine grained silty SAND/medium plasticity/medium dense/yellowish orange with some light gray	CL-SM	Slightly Moist	None	4	DPT
3	4	Inorganic silty CLAY with fine grained silty SAND/ medium plasticity/yellowish orange/medium dense	CL-SM	Slightly Moist	None	1	DPT
4	5	Inorganic silty CLAY with fine grained silty SAND/medium dense/medium plasticity/yellowish orange	CL-SM	Slightly Moist	None	<1	DPT
5	6	Inorganic silty CLAY with fine grained silty SAND/medium dense/medium plasticity/yellowish orange	CL-SM	Moist	None	<1	DPT

REMARKS

BORING LOG

BORING NUMBER SB-9 **SITE LOCATION** Barge Offload Area **DRILLED BY** TWL
TOTAL DEPTH 6' MCAS Cherry Point, North Carolina **LOGGED BY** JAC

DRILLING DATE 11/28/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USGS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	1	Organic fine grained silty SAND with inorganic hard CLAY/high plasticity/SAND is loose/stiff CLAY/greenish gray-dark gray-yellowish orange	SM-CH	Slightly Moist	None	<1	DPT
1	2	Inorganic hard CLAY with little fine grained silty SAND/high plasticity/medium stiff-stiff/yellowish orange-light brown	CH	---	None	<1	DPT
2	3	Inorganic hard CLAY with fine grained silty SAND/medium-high plasticity/yellowish orange-light brown	CH-SM	Slightly Moist	None	<1	DPT
3	4	Fine-medium grained silty SAND with some inorganic silty CLAY/low plasticity/SAND is poorly sorted/yellowish orange-light brown	SM-CL	Slightly Moist	None	<1	DPT
5	6	Fine grained silty SAND with very little silty CLAY/well sorted/medium dense/yellowish orange	SM	Slightly Moist	None	<1	DPT

REMARKS

BORING LOG

BORING NUMBER SB-10 **SITE LOCATION** Barge Offload Area **DRILLED BY** TWL
TOTAL DEPTH 6' MCAS Cherry Point, North Carolina **LOGGED BY** JAC

DRILLING DATE 11/28/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USGS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	1	Fine-medium grained organic silty SAND/poorly sorted/medium dense/dark-olive gray with some yellowish orange	SM	Slightly Moist	None	<1	DPT
1	2	Fine grained silty SAND with some inorganic fat CLAY/high plasticity/stiff/SAND is poorly sorted/ medium dense/olive gray-yellowish orange-orange	SM-CH	Slightly Moist	None	<1	DPT
2	3	Fine-medium grained silty SAND/some organic SILTS and some inorganic hard CLAY/medium plasticity/SAND is poorly sorted/medium dense/orange with some dark gray	SM-CH	Slightly Moist	None	<1	DPT
3	4	Fine grained silty SAND with some inorganic silty CLAY/medium plasticity/SAND is poorly sorted/ medium dense/orange-light gray	SM-CL	Slightly Moist	None	<1	DPT
4	5	Medium grained silty SAND with very little silty CLAY/well sorted/medium dense/orange	SM	---	None	1	DPT
5	6	Fine grained silty SAND/well sorted/medium dense/orange	SM	Slightly Moist	None	1	DPT

REMARKS

BORING LOG

BORING NUMBER SB-11 **SITE LOCATION** Barge Offload Area **DRILLED BY** TWL
TOTAL DEPTH 5' MCAS Cherry Point, North Carolina **LOGGED BY** JAC

DRILLING DATE 11/28/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USGS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	1	Fine grained silty SAND with organic silty CLAY/well sorted/low plasticity/yellowish orange-olive-dark gray	SC	Slightly Moist	None	<1	DPT
1	2	Very fine-fine grained silty SAND with little inorganic silty CLAY/well sorted/medium dense/yellowish orange-greenish gray	SM	Slightly Moist	None	<1	DPT
2	3	Inorganic hard CLAY with SILTS and some fine grained silty SAND/medium-high plasticity/ medium stiff/yellowish orange-greenish gray	CH-SM	Slightly Moist	None	1	DPT
3	4	Inorganic fat CLAY with very little SILTs/high plasticity/medium stiff-stiff/yellowish orange-greenish gray	CH	Moist	None	<1	DPT
4	5	Inorganic fat CLAY/high plasticity/stiff/yellowish orange-greenish gray	CH	Moist	None	<1	DPT

REMARKS

BORING LOG

BORING NUMBER SB-12 **SITE LOCATION** Barge Offload Area **DRILLED BY** TWL
TOTAL DEPTH 4' MCAS Cherry Point, North Carolina **LOGGED BY** JAC

DRILLING DATE 11/28/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USGS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	1	Fine-medium grained silty SAND with some inorganic silty CLAY/poorly sorted/low plasticity/light-olive gray	SM-CL	Slightly Moist	Slight	<1	DPT
1	2	Fine-medium grained silty SAND with inorganic silty CLAY/medium plasticity/poorly sorted SAND/yellowish orange-olive gray	SM-CL	Slightly Moist	Very Slight	7	DPT
2	3	Fine-medium grained silty SAND with inorganic silty CLAY/low-medium plasticity/poorly sorted SAND/yellowish orange-orange-some olive gray	SM-CL	Slightly Moist	Moderate	20	DPT
3	4	Fine-medium grained silty SAND with some inorganic silty CLAY/low plasticity/SAND is poorly sorted/medium dense/orange-yellowish orange	SM-SC	Moist	Moderate	10	DPT

REMARKS

APPENDIX B

LABORATORY REPORTS/CHAIN-OF-CUSTODY RECORDS

BWC 12-8-01

PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Tom Landis
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

December 8, 2000

Report Number: G128-665

Client Project ID: Barge Offload Area

Dear Mr. Landis,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Laboratory Director
Mark Randall

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-8 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10460
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.2

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.058	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0058	BQL
Bromobenzene	0.0058	BQL
Bromochloromethane	0.0058	BQL
Bromodichloromethane	0.0058	BQL
Bromoform	0.0058	BQL
Bromomethane	0.0058	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0058	BQL
sec-Butylbenzene	0.0058	BQL
tert-Butylbenzene	0.0058	BQL
Carbon disulfide	0.0058	BQL
Carbon tetrachloride	0.0058	BQL
Chlorobenzene	0.0058	BQL
Chloroethane	0.0058	BQL
2-Chloroethyl vinyl ether	0.0058	BQL
Chloroform	0.0058	BQL
Chloromethane	0.0058	BQL
2-Chlorotoluene	0.0058	BQL
4-Chlorotoluene	0.0058	BQL
Dibromochloromethane	0.0058	BQL
1,2-Dibromo-3-chloropropane	0.0058	BQL
Dibromomethane	0.0058	BQL
1,2-Dibromoethane (EDB)	0.0058	BQL
1,2-Dichlorobenzene	0.0058	BQL
1,3-Dichlorobenzene	0.0058	BQL
1,4-Dichlorobenzene	0.0058	BQL
trans-1,4-Dichloro-2-butene	0.0058	BQL
1,1-Dichloroethane	0.0058	BQL
1,1-Dichloroethene	0.0058	BQL
1,2-Dichloroethane	0.0058	BQL
cis-1,2-Dichloroethene	0.0058	BQL
trans-1,2-dichloroethene	0.0058	BQL
1,2-Dichloropropane	0.0058	BQL
1,3-Dichloropropane	0.0058	BQL
2,2-Dichloropropane	0.0058	BQL
1,1-Dichloropropene	0.0058	BQL
cis-1,3-Dichloropropene	0.0058	BQL
trans-1,3-Dichloropropene	0.0058	BQL
Dichlorodifluoromethane	0.0058	BQL
Diisopropyl ether (DIPE)	0.0058	BQL
Ethylbenzene	0.0058	BQL
Hexachlorobutadiene	0.0058	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-8 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10460
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.2

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0058	BQL
Iodomethane	0.0058	BQL
Isopropylbenzene	0.0058	BQL
4-Isopropyltoluene	0.0058	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0058	BQL
Methyl-tert-butyl ether (MTBE)	0.0058	BQL
Naphthalene	0.0058	BQL
n-Propyl benzene	0.0058	BQL
Styrene	0.0058	BQL
1,1,1,2-Tetrachloroethane	0.0058	BQL
1,1,2,2-Tetrachloroethane	0.0058	BQL
Tetrachloroethene	0.0058	BQL
Toluene	0.0058	BQL
1,2,3-Trichlorobenzene	0.0058	BQL
1,2,4-Trichlorobenzene	0.0058	BQL
Trichloroethene	0.0058	BQL
1,1,1-Trichloroethane	0.0058	BQL
1,1,2-Trichloroethane	0.0058	BQL
Trichlorofluoromethane	0.0058	BQL
1,2,3-Trichloropropane	0.0058	BQL
1,2,4-Trimethylbenzene	0.0058	BQL
1,3,5-Trimethylbenzene	0.0058	BQL
Vinyl chloride	0.0058	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.0058	BQL

Surrogate Spike Recoveries

Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	47.6	95
1,2-Dichloroethane-d4	50	53.6	107
Toluene-d8	50	46.8	94

Comments:
All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-8 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10461
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.058	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0058	BQL
Bromobenzene	0.0058	BQL
Bromochloromethane	0.0058	BQL
Bromodichloromethane	0.0058	BQL
Bromoform	0.0058	BQL
Bromomethane	0.0058	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0058	BQL
sec-Butylbenzene	0.0058	BQL
tert-Butylbenzene	0.0058	BQL
Carbon disulfide	0.0058	BQL
Carbon tetrachloride	0.0058	BQL
Chlorobenzene	0.0058	BQL
Chloroethane	0.0058	BQL
2-Chloroethyl vinyl ether	0.0058	BQL
Chloroform	0.0058	BQL
Chloromethane	0.0058	BQL
2-Chlorotoluene	0.0058	BQL
4-Chlorotoluene	0.0058	BQL
Dibromochloromethane	0.0058	BQL
1,2-Dibromo-3-chloropropane	0.0058	BQL
Dibromomethane	0.0058	BQL
1,2-Dibromoethane (EDB)	0.0058	BQL
1,2-Dichlorobenzene	0.0058	BQL
1,3-Dichlorobenzene	0.0058	BQL
1,4-Dichlorobenzene	0.0058	BQL
trans-1,4-Dichloro-2-butene	0.0058	BQL
1,1-Dichloroethane	0.0058	BQL
1,1-Dichloroethene	0.0058	BQL
1,2-Dichloroethane	0.0058	BQL
cis-1,2-Dichloroethene	0.0058	BQL
trans-1,2-dichloroethene	0.0058	BQL
1,2-Dichloropropane	0.0058	BQL
1,3-Dichloropropane	0.0058	BQL
2,2-Dichloropropane	0.0058	BQL
1,1-Dichloropropene	0.0058	BQL
cis-1,3-Dichloropropene	0.0058	BQL
trans-1,3-Dichloropropene	0.0058	BQL
Dichlorodifluoromethane	0.0058	BQL
Diisopropyl ether (DIPE)	0.0058	BQL
Ethylbenzene	0.0058	BQL
Hexachlorobutadiene	0.0058	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-8 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10461
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0058	BQL
Iodomethane	0.0058	BQL
Isopropylbenzene	0.0058	BQL
4-Isopropyltoluene	0.0058	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0058	BQL
Methyl-tert-butyl ether (MTBE)	0.0058	BQL
Naphthalene	0.0058	BQL
n-Propyl benzene	0.0058	BQL
Styrene	0.0058	BQL
1,1,1,2-Tetrachloroethane	0.0058	BQL
1,1,2,2-Tetrachloroethane	0.0058	BQL
Tetrachloroethene	0.0058	BQL
Toluene	0.0058	BQL
1,2,3-Trichlorobenzene	0.0058	BQL
1,2,4-Trichlorobenzene	0.0058	BQL
Trichloroethene	0.0058	BQL
1,1,1-Trichloroethane	0.0058	BQL
1,1,2-Trichloroethane	0.0058	BQL
Trichlorofluoromethane	0.0058	BQL
1,2,3-Trichloropropane	0.0058	BQL
1,2,4-Trimethylbenzene	0.0058	BQL
1,3,5-Trimethylbenzene	0.0058	BQL
Vinyl chloride	0.0058	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.0058	BQL

Surrogate Spike Recoveries Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	47.2	94
1,2-Dichloroethane-d4	50	51.7	103
Toluene-d8	50	47.3	95

Comments:
All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-9 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10462
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.1

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.055	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0055	BQL
Bromobenzene	0.0055	BQL
Bromochloromethane	0.0055	BQL
Bromodichloromethane	0.0055	BQL
Bromoform	0.0055	BQL
Bromomethane	0.0055	BQL
2-Butanone	0.027	BQL
n-Butylbenzene	0.0055	BQL
sec-Butylbenzene	0.0055	BQL
tert-Butylbenzene	0.0055	BQL
Carbon disulfide	0.0055	BQL
Carbon tetrachloride	0.0055	BQL
Chlorobenzene	0.0055	BQL
Chloroethane	0.0055	BQL
2-Chloroethyl vinyl ether	0.0055	BQL
Chloroform	0.0055	BQL
Chloromethane	0.0055	BQL
2-Chlorotoluene	0.0055	BQL
4-Chlorotoluene	0.0055	BQL
Dibromochloromethane	0.0055	BQL
1,2-Dibromo-3-chloropropane	0.0055	BQL
Dibromomethane	0.0055	BQL
1,2-Dibromoethane (EDB)	0.0055	BQL
1,2-Dichlorobenzene	0.0055	BQL
1,3-Dichlorobenzene	0.0055	BQL
1,4-Dichlorobenzene	0.0055	BQL
trans-1,4-Dichloro-2-butene	0.0055	BQL
1,1-Dichloroethane	0.0055	BQL
1,1-Dichloroethene	0.0055	BQL
1,2-Dichloroethane	0.0055	BQL
cis-1,2-Dichloroethene	0.0055	BQL
trans-1,2-dichloroethene	0.0055	BQL
1,2-Dichloropropane	0.0055	BQL
1,3-Dichloropropane	0.0055	BQL
2,2-Dichloropropane	0.0055	BQL
1,1-Dichloropropene	0.0055	BQL
cis-1,3-Dichloropropene	0.0055	BQL
trans-1,3-Dichloropropene	0.0055	BQL
Dichlorodifluoromethane	0.0055	BQL
Diisopropyl ether (DIPE)	0.0055	BQL
Ethylbenzene	0.0055	BQL
Hexachlorobutadiene	0.0055	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-9 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10462
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.1

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0055	BQL
Iodomethane	0.0055	BQL
Isopropylbenzene	0.0055	BQL
4-Isopropyltoluene	0.0055	BQL
Methylene chloride	0.022	BQL
4-Methyl-2-pentanone	0.0055	BQL
Methyl-tert-butyl ether (MTBE)	0.0055	BQL
Naphthalene	0.0055	BQL
n-Propyl benzene	0.0055	BQL
Styrene	0.0055	BQL
1,1,1,2-Tetrachloroethane	0.0055	BQL
1,1,2,2-Tetrachloroethane	0.0055	BQL
Tetrachloroethene	0.0055	BQL
Toluene	0.0055	BQL
1,2,3-Trichlorobenzene	0.0055	BQL
1,2,4-Trichlorobenzene	0.0055	BQL
Trichloroethene	0.0055	BQL
1,1,1-Trichloroethane	0.0055	BQL
1,1,2-Trichloroethane	0.0055	BQL
Trichlorofluoromethane	0.0055	BQL
1,2,3-Trichloropropane	0.0055	BQL
1,2,4-Trimethylbenzene	0.0055	BQL
1,3,5-Trimethylbenzene	0.0055	BQL
Vinyl chloride	0.0055	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0055	BQL

Surrogate Spike Recoveries Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	46.3	93
1,2-Dichloroethane-d4	50	51.7	103
Toluene-d8	50	48.3	97

Comments:
All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: SB-9 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10463
Lab Project ID: G128-665
Matrix: Soil %Solids: 89.3

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.056	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0056	BQL
Bromobenzene	0.0056	BQL
Bromochloromethane	0.0056	BQL
Bromodichloromethane	0.0056	BQL
Bromoform	0.0056	BQL
Bromomethane	0.0056	BQL
2-Butanone	0.028	BQL
n-Butylbenzene	0.0056	BQL
sec-Butylbenzene	0.0056	BQL
tert-Butylbenzene	0.0056	BQL
Carbon disulfide	0.0056	BQL
Carbon tetrachloride	0.0056	BQL
Chlorobenzene	0.0056	BQL
Chloroethane	0.0056	BQL
2-Chloroethyl vinyl ether	0.0056	BQL
Chloroform	0.0056	BQL
Chloromethane	0.0056	BQL
2-Chlorotoluene	0.0056	BQL
4-Chlorotoluene	0.0056	BQL
Dibromochloromethane	0.0056	BQL
1,2-Dibromo-3-chloropropane	0.0056	BQL
Dibromomethane	0.0056	BQL
1,2-Dibromoethane (EDB)	0.0056	BQL
1,2-Dichlorobenzene	0.0056	BQL
1,3-Dichlorobenzene	0.0056	BQL
1,4-Dichlorobenzene	0.0056	BQL
trans-1,4-Dichloro-2-butene	0.0056	BQL
1,1-Dichloroethane	0.0056	BQL
1,1-Dichloroethene	0.0056	BQL
1,2-Dichloroethane	0.0056	BQL
cis-1,2-Dichloroethene	0.0056	BQL
trans-1,2-dichloroethene	0.0056	BQL
1,2-Dichloropropane	0.0056	BQL
1,3-Dichloropropane	0.0056	BQL
2,2-Dichloropropane	0.0056	BQL
1,1-Dichloropropene	0.0056	BQL
cis-1,3-Dichloropropene	0.0056	BQL
trans-1,3-Dichloropropene	0.0056	BQL
Dichlorodifluoromethane	0.0056	BQL
Diisopropyl ether (DIPE)	0.0056	BQL
Ethylbenzene	0.0056	BQL
Hexachlorobutadiene	0.0056	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-9 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10463
Lab Project ID: G128-665
Matrix: Soil %Solids: 89.3

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0056	BQL
Iodomethane	0.0056	BQL
Isopropylbenzene	0.0056	BQL
4-Isopropyltoluene	0.0056	BQL
Methylene chloride	0.022	BQL
4-Methyl-2-pentanone	0.0056	BQL
Methyl-tert-butyl ether (MTBE)	0.0056	BQL
Naphthalene	0.0056	BQL
n-Propyl benzene	0.0056	BQL
Styrene	0.0056	BQL
1,1,1,2-Tetrachloroethane	0.0056	BQL
1,1,2,2-Tetrachloroethane	0.0056	BQL
Tetrachloroethene	0.0056	BQL
Toluene	0.0056	BQL
1,2,3-Trichlorobenzene	0.0056	BQL
1,2,4-Trichlorobenzene	0.0056	BQL
Trichloroethene	0.0056	BQL
1,1,1-Trichloroethane	0.0056	BQL
1,1,2-Trichloroethane	0.0056	BQL
Trichlorofluoromethane	0.0056	BQL
1,2,3-Trichloropropane	0.0056	BQL
1,2,4-Trimethylbenzene	0.0056	BQL
1,3,5-Trimethylbenzene	0.0056	BQL
Vinyl chloride	0.0056	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0056	BQL

Surrogate Spike Recoveries Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	46.0	92
1,2-Dichloroethane-d4	50	50.4	101
Toluene-d8	50	48.0	96

Comments:
All results are corrected for dilution.

Reviewed by: RNP

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: SB-10 (4-5)
Client Project ID: Barge Offload Area
Lab Sample ID: 10464
Lab Project ID: G128-665
Matrix: Soil %Solids: 92.9

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.054	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0054	BQL
Bromobenzene	0.0054	BQL
Bromochloromethane	0.0054	BQL
Bromodichloromethane	0.0054	BQL
Bromoform	0.0054	BQL
Bromomethane	0.0054	BQL
2-Butanone	0.027	BQL
n-Butylbenzene	0.0054	BQL
sec-Butylbenzene	0.0054	BQL
tert-Butylbenzene	0.0054	BQL
Carbon disulfide	0.0054	BQL
Carbon tetrachloride	0.0054	BQL
Chlorobenzene	0.0054	BQL
Chloroethane	0.0054	BQL
2-Chloroethyl vinyl ether	0.0054	BQL
Chloroform	0.0054	BQL
Chloromethane	0.0054	BQL
2-Chlorotoluene	0.0054	BQL
4-Chlorotoluene	0.0054	BQL
Dibromochloromethane	0.0054	BQL
1,2-Dibromo-3-chloropropane	0.0054	BQL
Dibromomethane	0.0054	BQL
1,2-Dibromoethane (EDB)	0.0054	BQL
1,2-Dichlorobenzene	0.0054	BQL
1,3-Dichlorobenzene	0.0054	BQL
1,4-Dichlorobenzene	0.0054	BQL
trans-1,4-Dichloro-2-butene	0.0054	BQL
1,1-Dichloroethane	0.0054	BQL
1,1-Dichloroethene	0.0054	BQL
1,2-Dichloroethane	0.0054	BQL
cis-1,2-Dichloroethene	0.0054	BQL
trans-1,2-dichloroethene	0.0054	BQL
1,2-Dichloropropane	0.0054	BQL
1,3-Dichloropropane	0.0054	BQL
2,2-Dichloropropane	0.0054	BQL
1,1-Dichloropropene	0.0054	BQL
cis-1,3-Dichloropropene	0.0054	BQL
trans-1,3-Dichloropropene	0.0054	BQL
Dichlorodifluoromethane	0.0054	BQL
Diisopropyl ether (DIPE)	0.0054	BQL
Ethylbenzene	0.0054	BQL
Hexachlorobutadiene	0.0054	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-10 (4-5)
Client Project ID: Barge Offload Area
Lab Sample ID: 10464
Lab Project ID: G128-665
Matrix: Soil %Solids: 92.9

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0054	BQL
Iodomethane	0.0054	BQL
Isopropylbenzene	0.0054	BQL
4-Isopropyltoluene	0.0054	BQL
Methylene chloride	0.022	BQL
4-Methyl-2-pentanone	0.0054	BQL
Methyl-tert-butyl ether (MTBE)	0.0054	BQL
Naphthalene	0.0054	BQL
n-Propyl benzene	0.0054	BQL
Styrene	0.0054	BQL
1,1,1,2-Tetrachloroethane	0.0054	BQL
1,1,2,2-Tetrachloroethane	0.0054	BQL
Tetrachloroethene	0.0054	BQL
Toluene	0.0054	BQL
1,2,3-Trichlorobenzene	0.0054	BQL
1,2,4-Trichlorobenzene	0.0054	BQL
Trichloroethene	0.0054	BQL
1,1,1-Trichloroethane	0.0054	BQL
1,1,2-Trichloroethane	0.0054	BQL
Trichlorofluoromethane	0.0054	BQL
1,2,3-Trichloropropane	0.0054	BQL
1,2,4-Trimethylbenzene	0.0054	BQL
1,3,5-Trimethylbenzene	0.0054	BQL
Vinyl chloride	0.0054	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0054	BQL

Surrogate Spike Recoveries

Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	45.4	91
1,2-Dichloroethane-d4	50	57.2	114
Toluene-d8	50	49.3	99

Comments:
All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-10 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10465
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.3

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.055	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0055	BQL
Bromobenzene	0.0055	BQL
Bromochloromethane	0.0055	BQL
Bromodichloromethane	0.0055	BQL
Bromoform	0.0055	BQL
Bromomethane	0.0055	BQL
2-Butanone	0.027	BQL
n-Butylbenzene	0.0055	BQL
sec-Butylbenzene	0.0055	BQL
tert-Butylbenzene	0.0055	BQL
Carbon disulfide	0.0055	BQL
Carbon tetrachloride	0.0055	BQL
Chlorobenzene	0.0055	BQL
Chloroethane	0.0055	BQL
2-Chloroethyl vinyl ether	0.0055	BQL
Chloroform	0.0055	BQL
Chloromethane	0.0055	BQL
2-Chlorotoluene	0.0055	BQL
4-Chlorotoluene	0.0055	BQL
Dibromochloromethane	0.0055	BQL
1,2-Dibromo-3-chloropropane	0.0055	BQL
Dibromomethane	0.0055	BQL
1,2-Dibromoethane (EDB)	0.0055	BQL
1,2-Dichlorobenzene	0.0055	BQL
1,3-Dichlorobenzene	0.0055	BQL
1,4-Dichlorobenzene	0.0055	BQL
trans-1,4-Dichloro-2-butene	0.0055	BQL
1,1-Dichloroethane	0.0055	BQL
1,1-Dichloroethene	0.0055	BQL
1,2-Dichloroethane	0.0055	BQL
cis-1,2-Dichloroethene	0.0055	BQL
trans-1,2-dichloroethene	0.0055	BQL
1,2-Dichloropropane	0.0055	BQL
1,3-Dichloropropane	0.0055	BQL
2,2-Dichloropropane	0.0055	BQL
1,1-Dichloropropene	0.0055	BQL
cis-1,3-Dichloropropene	0.0055	BQL
trans-1,3-Dichloropropene	0.0055	BQL
Dichlorodifluoromethane	0.0055	BQL
Diisopropyl ether (DIPE)	0.0055	BQL
Ethylbenzene	0.0055	BQL
Hexachlorobutadiene	0.0055	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: SB-10 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10465
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.3

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0055	BQL
Iodomethane	0.0055	BQL
Isopropylbenzene	0.0055	BQL
4-Isopropyltoluene	0.0055	BQL
Methylene chloride	0.022	BQL
4-Methyl-2-pentanone	0.0055	BQL
Methyl-tert-butyl ether (MTBE)	0.0055	BQL
Naphthalene	0.0055	BQL
n-Propyl benzene	0.0055	BQL
Styrene	0.0055	BQL
1,1,1,2-Tetrachloroethane	0.0055	BQL
1,1,2,2-Tetrachloroethane	0.0055	BQL
Tetrachloroethene	0.0055	BQL
Toluene	0.0055	BQL
1,2,3-Trichlorobenzene	0.0055	BQL
1,2,4-Trichlorobenzene	0.0055	BQL
Trichloroethene	0.0055	BQL
1,1,1-Trichloroethane	0.0055	BQL
1,1,2-Trichloroethane	0.0055	BQL
Trichlorofluoromethane	0.0055	BQL
1,2,3-Trichloropropane	0.0055	BQL
1,2,4-Trimethylbenzene	0.0055	BQL
1,3,5-Trimethylbenzene	0.0055	BQL
Vinyl chloride	0.0055	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0055	BQL

Surrogate Spike Recoveries

Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	46.9	94
1,2-Dichloroethane-d4	50	51.7	103
Toluene-d8	50	47.9	96

Comments:

All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-11 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10466
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.058	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0058	BQL
Bromobenzene	0.0058	BQL
Bromochloromethane	0.0058	BQL
Bromodichloromethane	0.0058	BQL
Bromoform	0.0058	BQL
Bromomethane	0.0058	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0058	BQL
sec-Butylbenzene	0.0058	BQL
tert-Butylbenzene	0.0058	BQL
Carbon disulfide	0.0058	BQL
Carbon tetrachloride	0.0058	BQL
Chlorobenzene	0.0058	BQL
Chloroethane	0.0058	BQL
2-Chloroethyl vinyl ether	0.0058	BQL
Chloroform	0.0058	BQL
Chloromethane	0.0058	BQL
2-Chlorotoluene	0.0058	BQL
4-Chlorotoluene	0.0058	BQL
Dibromochloromethane	0.0058	BQL
1,2-Dibromo-3-chloropropane	0.0058	BQL
Dibromomethane	0.0058	BQL
1,2-Dibromoethane (EDB)	0.0058	BQL
1,2-Dichlorobenzene	0.0058	BQL
1,3-Dichlorobenzene	0.0058	BQL
1,4-Dichlorobenzene	0.0058	BQL
trans-1,4-Dichloro-2-butene	0.0058	BQL
1,1-Dichloroethane	0.0058	BQL
1,1-Dichloroethene	0.0058	BQL
1,2-Dichloroethane	0.0058	BQL
cis-1,2-Dichloroethene	0.0058	BQL
trans-1,2-dichloroethene	0.0058	BQL
1,2-Dichloropropane	0.0058	BQL
1,3-Dichloropropane	0.0058	BQL
2,2-Dichloropropane	0.0058	BQL
1,1-Dichloropropene	0.0058	BQL
cis-1,3-Dichloropropene	0.0058	BQL
trans-1,3-Dichloropropene	0.0058	BQL
Dichlorodifluoromethane	0.0058	BQL
Diisopropyl ether (DIPE)	0.0058	BQL
Ethylbenzene	0.0058	BQL
Hexachlorobutadiene	0.0058	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-11 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10466
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0058	BQL
Iodomethane	0.0058	BQL
Isopropylbenzene	0.0058	BQL
4-Isopropyltoluene	0.0058	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0058	BQL
Methyl-tert-butyl ether (MTBE)	0.0058	BQL
Naphthalene	0.0058	BQL
n-Propyl benzene	0.0058	BQL
Styrene	0.0058	BQL
1,1,1,2-Tetrachloroethane	0.0058	BQL
1,1,2,2-Tetrachloroethane	0.0058	BQL
Tetrachloroethene	0.0058	BQL
Toluene	0.0058	BQL
1,2,3-Trichlorobenzene	0.0058	BQL
1,2,4-Trichlorobenzene	0.0058	BQL
Trichloroethene	0.0058	BQL
1,1,1-Trichloroethane	0.0058	BQL
1,1,2-Trichloroethane	0.0058	BQL
Trichlorofluoromethane	0.0058	BQL
1,2,3-Trichloropropane	0.0058	BQL
1,2,4-Trimethylbenzene	0.0058	BQL
1,3,5-Trimethylbenzene	0.0058	BQL
Vinyl chloride	0.0058	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.0058	BQL

Surrogate Spike Recoveries

Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	45.4	91
1,2-Dichloroethane-d4	50	52.5	105
Toluene-d8	50	48.2	96

Comments:
All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-11 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10467
Lab Project ID: G128-665
Matrix: Soil %Solids: 83.1

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.06	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.006	BQL
Bromobenzene	0.006	BQL
Bromochloromethane	0.006	BQL
Bromodichloromethane	0.006	BQL
Bromoform	0.006	BQL
Bromomethane	0.006	BQL
2-Butanone	0.03	BQL
n-Butylbenzene	0.006	BQL
sec-Butylbenzene	0.006	BQL
tert-Butylbenzene	0.006	BQL
Carbon disulfide	0.006	BQL
Carbon tetrachloride	0.006	BQL
Chlorobenzene	0.006	BQL
Chloroethane	0.006	BQL
2-Chloroethyl vinyl ether	0.006	BQL
Chloroform	0.006	BQL
Chloromethane	0.006	BQL
2-Chlorotoluene	0.006	BQL
4-Chlorotoluene	0.006	BQL
Dibromochloromethane	0.006	BQL
1,2-Dibromo-3-chloropropane	0.006	BQL
Dibromomethane	0.006	BQL
1,2-Dibromoethane (EDB)	0.006	BQL
1,2-Dichlorobenzene	0.006	BQL
1,3-Dichlorobenzene	0.006	BQL
1,4-Dichlorobenzene	0.006	BQL
trans-1,4-Dichloro-2-butene	0.006	BQL
1,1-Dichloroethane	0.006	BQL
1,1-Dichloroethene	0.006	BQL
1,2-Dichloroethane	0.006	BQL
cis-1,2-Dichloroethene	0.006	BQL
trans-1,2-dichloroethene	0.006	BQL
1,2-Dichloropropane	0.006	BQL
1,3-Dichloropropane	0.006	BQL
2,2-Dichloropropane	0.006	BQL
1,1-Dichloropropene	0.006	BQL
cis-1,3-Dichloropropene	0.006	BQL
trans-1,3-Dichloropropene	0.006	BQL
Dichlorodifluoromethane	0.006	BQL
Diisopropyl ether (DIPE)	0.006	BQL
Ethylbenzene	0.006	BQL
Hexachlorobutadiene	0.006	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-11 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10467
Lab Project ID: G128-665
Matrix: Soil %Solids: 83.1

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.006	BQL
Iodomethane	0.006	BQL
Isopropylbenzene	0.006	BQL
4-Isopropyltoluene	0.006	BQL
Methylene chloride	0.024	BQL
4-Methyl-2-pentanone	0.006	BQL
Methyl-tert-butyl ether (MTBE)	0.006	BQL
Naphthalene	0.006	BQL
n-Propyl benzene	0.006	BQL
Styrene	0.006	BQL
1,1,1,2-Tetrachloroethane	0.006	BQL
1,1,2,2-Tetrachloroethane	0.006	BQL
Tetrachloroethene	0.006	BQL
Toluene	0.006	BQL
1,2,3-Trichlorobenzene	0.006	BQL
1,2,4-Trichlorobenzene	0.006	BQL
Trichloroethene	0.006	BQL
1,1,1-Trichloroethane	0.006	BQL
1,1,2-Trichloroethane	0.006	BQL
Trichlorofluoromethane	0.006	BQL
1,2,3-Trichloropropane	0.006	BQL
1,2,4-Trimethylbenzene	0.006	BQL
1,3,5-Trimethylbenzene	0.006	BQL
Vinyl chloride	0.006	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.006	BQL

Surrogate Spike Recoveries

Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	46.5	93
1,2-Dichloroethane-d4	50	53.5	107
Toluene-d8	50	46.8	94

Comments:
All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-12 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10468
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.5

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.058	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0058	BQL
Bromobenzene	0.0058	BQL
Bromochloromethane	0.0058	BQL
Bromodichloromethane	0.0058	BQL
Bromoform	0.0058	BQL
Bromomethane	0.0058	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0058	BQL
sec-Butylbenzene	0.0058	BQL
tert-Butylbenzene	0.0058	BQL
Carbon disulfide	0.0058	BQL
Carbon tetrachloride	0.0058	BQL
Chlorobenzene	0.0058	BQL
Chloroethane	0.0058	BQL
2-Chloroethyl vinyl ether	0.0058	BQL
Chloroform	0.0058	BQL
Chloromethane	0.0058	BQL
2-Chlorotoluene	0.0058	BQL
4-Chlorotoluene	0.0058	BQL
Dibromochloromethane	0.0058	BQL
1,2-Dibromo-3-chloropropane	0.0058	BQL
Dibromomethane	0.0058	BQL
1,2-Dibromoethane (EDB)	0.0058	BQL
1,2-Dichlorobenzene	0.0058	BQL
1,3-Dichlorobenzene	0.0058	BQL
1,4-Dichlorobenzene	0.0058	BQL
trans-1,4-Dichloro-2-butene	0.0058	BQL
1,1-Dichloroethane	0.0058	BQL
1,1-Dichloroethene	0.0058	BQL
1,2-Dichloroethane	0.0058	BQL
cis-1,2-Dichloroethene	0.0058	BQL
trans-1,2-dichloroethene	0.0058	BQL
1,2-Dichloropropane	0.0058	BQL
1,3-Dichloropropane	0.0058	BQL
2,2-Dichloropropane	0.0058	BQL
1,1-Dichloropropene	0.0058	BQL
cis-1,3-Dichloropropene	0.0058	BQL
trans-1,3-Dichloropropene	0.0058	BQL
Dichlorodifluoromethane	0.0058	BQL
Diisopropyl ether (DIPE)	0.0058	BQL
Ethylbenzene	0.0058	BQL
Hexachlorobutadiene	0.0058	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B

Client Sample ID: SB-12 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10468
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.5

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0058	BQL
Iodomethane	0.0058	BQL
Isopropylbenzene	0.0058	BQL
4-Isopropyltoluene	0.0058	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0058	BQL
Methyl-tert-butyl ether (MTBE)	0.0058	BQL
Naphthalene	0.0058	BQL
n-Propyl benzene	0.0058	BQL
Styrene	0.0058	BQL
1,1,1,2-Tetrachloroethane	0.0058	BQL
1,1,2,2-Tetrachloroethane	0.0058	BQL
Tetrachloroethene	0.0058	BQL
Toluene	0.0058	BQL
1,2,3-Trichlorobenzene	0.0058	BQL
1,2,4-Trichlorobenzene	0.0058	BQL
Trichloroethene	0.0058	BQL
1,1,1-Trichloroethane	0.0058	BQL
1,1,2-Trichloroethane	0.0058	BQL
Trichlorofluoromethane	0.0058	BQL
1,2,3-Trichloropropane	0.0058	BQL
1,2,4-Trimethylbenzene	0.0058	BQL
1,3,5-Trimethylbenzene	0.0058	BQL
Vinyl chloride	0.0058	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.0058	BQL

Surrogate Spike Recoveries Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	46.5	93
1,2-Dichloroethane-d4	50	51.7	103
Toluene-d8	50	47.6	95

Comments:

All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-12 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10469
Lab Project ID: G128-665
Matrix: Soil %Solids: 90.2

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.055	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0055	BQL
Bromobenzene	0.0055	BQL
Bromochloromethane	0.0055	BQL
Bromodichloromethane	0.0055	BQL
Bromoform	0.0055	BQL
Bromomethane	0.0055	BQL
2-Butanone	0.028	BQL
n-Butylbenzene	0.0055	BQL
sec-Butylbenzene	0.0055	BQL
tert-Butylbenzene	0.0055	BQL
Carbon disulfide	0.0055	BQL
Carbon tetrachloride	0.0055	BQL
Chlorobenzene	0.0055	BQL
Chloroethane	0.0055	BQL
2-Chloroethyl vinyl ether	0.0055	BQL
Chloroform	0.0055	BQL
Chloromethane	0.0055	BQL
2-Chlorotoluene	0.0055	BQL
4-Chlorotoluene	0.0055	BQL
Dibromochloromethane	0.0055	BQL
1,2-Dibromo-3-chloropropane	0.0055	BQL
Dibromomethane	0.0055	BQL
1,2-Dibromoethane (EDB)	0.0055	BQL
1,2-Dichlorobenzene	0.0055	BQL
1,3-Dichlorobenzene	0.0055	BQL
1,4-Dichlorobenzene	0.0055	BQL
trans-1,4-Dichloro-2-butene	0.0055	BQL
1,1-Dichloroethane	0.0055	BQL
1,1-Dichloroethene	0.0055	BQL
1,2-Dichloroethane	0.0055	BQL
cis-1,2-Dichloroethene	0.0055	BQL
trans-1,2-dichloroethene	0.0055	BQL
1,2-Dichloropropane	0.0055	BQL
1,3-Dichloropropane	0.0055	BQL
2,2-Dichloropropane	0.0055	BQL
1,1-Dichloropropene	0.0055	BQL
cis-1,3-Dichloropropene	0.0055	BQL
trans-1,3-Dichloropropene	0.0055	BQL
Dichlorodifluoromethane	0.0055	BQL
Diisopropyl ether (DIPE)	0.0055	BQL
Ethylbenzene	0.0055	BQL
Hexachlorobutadiene	0.0055	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles
by GCMS 8260B

Client Sample ID: SB-12 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10469
Lab Project ID: G128-665
Matrix: Soil %Solids: 90.2

Date Analyzed: 12/5/00
Analyzed By: RNP
Date Collected: 11/28/00
Date Received: 11/29/00
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
2-Hexanone	0.0055	BQL
Iodomethane	0.0055	BQL
Isopropylbenzene	0.0055	BQL
4-Isopropyltoluene	0.0055	BQL
Methylene chloride	0.022	BQL
4-Methyl-2-pentanone	0.0055	BQL
Methyl-tert-butyl ether (MTBE)	0.0055	BQL
Naphthalene	0.0055	BQL
n-Propyl benzene	0.0055	BQL
Styrene	0.0055	BQL
1,1,1,2-Tetrachloroethane	0.0055	BQL
1,1,2,2-Tetrachloroethane	0.0055	BQL
Tetrachloroethene	0.0055	BQL
Toluene	0.0055	BQL
1,2,3-Trichlorobenzene	0.0055	BQL
1,2,4-Trichlorobenzene	0.0055	BQL
Trichloroethene	0.0055	BQL
1,1,1-Trichloroethane	0.0055	BQL
1,1,2-Trichloroethane	0.0055	BQL
Trichlorofluoromethane	0.0055	BQL
1,2,3-Trichloropropane	0.0055	BQL
1,2,4-Trimethylbenzene	0.0055	BQL
1,3,5-Trimethylbenzene	0.0055	BQL
Vinyl chloride	0.0055	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0055	BQL

Surrogate Spike Recoveries Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	43.6	87
1,2-Dichloroethane-d4	50	50.3	101
Toluene-d8	50	48.8	98

Comments:
All results are corrected for dilution.

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-8 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10460
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.2

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.36	BQL
Acenaphthylene	0.36	BQL
Anthracene	0.36	BQL
Benzo[a]anthracene	0.36	BQL
Benzo[a]pyrene	0.36	BQL
Benzo[b]fluoranthene	0.36	BQL
Benzo[g,h,i]perylene	0.36	BQL
Benzo[k]fluoranthene	0.36	BQL
Benzoic Acid	0.72	BQL
Bis(2-chloroethoxy)methane	0.36	BQL
Bis(2-chloroethyl)ether	0.36	BQL
Bis(2-chloroisopropyl)ether	0.36	BQL
Bis(2-ethylhexyl)phthalate	0.36	BQL
4-bromophenyl phenyl ether	0.36	BQL
Butylbenzylphthalate	0.36	BQL
4-Chloroaniline	0.36	BQL
4-Chloro-3-methylphenol	0.36	BQL
2-Chloronaphthalene	0.36	BQL
2-Chlorophenol	0.36	BQL
4-Chlorophenyl phenyl ether	0.36	BQL
Chrysene	0.36	BQL
Di-n-Butylphthalate	0.36	BQL
Di-n-octylphthalate	0.36	BQL
Dibenzo[a,h]anthracene	0.36	BQL
Dibenzofuran	0.36	BQL
1,2-Dichlorobenzene	0.36	BQL
1,3-Dichlorobenzene	0.36	BQL
1,4-Dichlorobenzene	0.36	BQL
3,3'-Dichlorobenzidine	0.72	BQL
2,4-Dichlorophenol	0.36	BQL
Diethylphthalate	0.36	BQL
2,4-Dimethylphenol	0.36	BQL
Dimethylphthalate	0.36	BQL
4,6-Dinitro-2-methylphenol	1.8	BQL
2,4-Dinitrophenol	1.8	BQL
2,4-Dinitrotoluene	0.36	BQL
2,6-Dinitrotoluene	0.36	BQL
Fluoranthene	0.36	BQL
Fluorene	0.36	BQL
Hexachlorobenzene	0.36	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-8 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10460
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.2

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.36	BQL
Hexachlorocyclopentadiene	0.72	BQL
Hexachloroethane	0.36	BQL
Indeno(1,2,3-c,d)pyrene	0.36	BQL
Isophorone	0.36	BQL
2-Methylnaphthalene	0.36	BQL
2-Methylphenol	0.36	BQL
3- & 4-Methylphenol	0.36	BQL
N-Nitrosodi-n-propylamine	0.36	BQL
N-Nitrosodiphenylamine	0.36	BQL
Naphthalene	0.36	BQL
2-Nitroaniline	0.36	BQL
3-Nitroaniline	0.36	BQL
4-Nitroaniline	0.36	BQL
Nitrobenzene	0.36	BQL
2-Nitrophenol	0.36	BQL
4-Nitrophenol	1.8	BQL
Pentachlorophenol	1.8	BQL
Phenanthrene	0.36	BQL
Phenol	0.36	BQL
Pyrene	0.36	BQL
1,2,4-Trichlorobenzene	0.36	BQL
2,4,5-Trichlorophenol	0.36	BQL
2,4,6-Trichlorophenol	0.36	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	5.8	59
2-Fluorophenol	10	7.9	79
Nitrobenzene-d5	10	7.2	72
Phenol-d6	10	6.9	69
2,4,6-Tribromophenol	10	5.6	56
4-Terphenyl-d14	10	7.9	79

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-8 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10461
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.36	BQL
Acenaphthylene	0.36	BQL
Anthracene	0.36	BQL
Benzo[a]anthracene	0.36	BQL
Benzo[a]pyrene	0.36	BQL
Benzo[b]fluoranthene	0.36	BQL
Benzo[g,h,i]perylene	0.36	BQL
Benzo[k]fluoranthene	0.36	BQL
Benzoic Acid	0.73	BQL
Bis(2-chloroethoxy)methane	0.36	BQL
Bis(2-chloroethyl)ether	0.36	BQL
Bis(2-chloroisopropyl)ether	0.36	BQL
Bis(2-ethylhexyl)phthalate	0.36	BQL
4-bromophenyl phenyl ether	0.36	BQL
Butylbenzylphthalate	0.36	BQL
4-Chloroaniline	0.36	BQL
4-Chloro-3-methylphenol	0.36	BQL
2-Chloronaphthalene	0.36	BQL
2-Chlorophenol	0.36	BQL
4-Chlorophenyl phenyl ether	0.36	BQL
Chrysene	0.36	BQL
Di-n-Butylphthalate	0.36	BQL
Di-n-octylphthalate	0.36	BQL
Dibenzo[a,h]anthracene	0.36	BQL
Dibenzofuran	0.36	BQL
1,2-Dichlorobenzene	0.36	BQL
1,3-Dichlorobenzene	0.36	BQL
1,4-Dichlorobenzene	0.36	BQL
3,3'-Dichlorobenzidine	0.73	BQL
2,4-Dichlorophenol	0.36	BQL
Diethylphthalate	0.36	BQL
2,4-Dimethylphenol	0.36	BQL
Dimethylphthalate	0.36	BQL
4,6-Dinitro-2-methylphenol	1.8	BQL
2,4-Dinitrophenol	1.8	BQL
2,4-Dinitrotoluene	0.36	BQL
2,6-Dinitrotoluene	0.36	BQL
Fluoranthene	0.36	BQL
Fluorene	0.36	BQL
Hexachlorobenzene	0.36	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-8 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10461
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.36	BQL
Hexachlorocyclopentadiene	0.73	BQL
Hexachloroethane	0.36	BQL
Indeno(1,2,3-c,d)pyrene	0.36	BQL
Isophorone	0.36	BQL
2-Methylnaphthalene	0.36	BQL
2-Methylphenol	0.36	BQL
3- & 4-Methylphenol	0.36	BQL
N-Nitrosodi-n-propylamine	0.36	BQL
N-Nitrosodiphenylamine	0.36	BQL
Naphthalene	0.36	BQL
2-Nitroaniline	0.36	BQL
3-Nitroaniline	0.36	BQL
4-Nitroaniline	0.36	BQL
Nitrobenzene	0.36	BQL
2-Nitrophenol	0.36	BQL
4-Nitrophenol	1.8	BQL
Pentachlorophenol	1.8	BQL
Phenanthrene	0.36	BQL
Phenol	0.36	BQL
Pyrene	0.36	BQL
1,2,4-Trichlorobenzene	0.36	BQL
2,4,5-Trichlorophenol	0.36	BQL
2,4,6-Trichlorophenol	0.36	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.6	76
2-Fluorophenol	10	9.2	92
Nitrobenzene-d5	10	8.9	89
Phenol-d6	10	7.8	78
2,4,6-Tribromophenol	10	7.2	72
4-Terphenyl-d14	10	9.4	94

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-9 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10462
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.1

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.34	BQL
Acenaphthylene	0.34	BQL
Anthracene	0.34	BQL
Benzo[a]anthracene	0.34	BQL
Benzo[a]pyrene	0.34	BQL
Benzo[b]fluoranthene	0.34	BQL
Benzo[g,h,i]perylene	0.34	BQL
Benzo[k]fluoranthene	0.34	BQL
Benzoic Acid	0.68	BQL
Bis(2-chloroethoxy)methane	0.34	BQL
Bis(2-chloroethyl)ether	0.34	BQL
Bis(2-chloroisopropyl)ether	0.34	BQL
Bis(2-ethylhexyl)phthalate	0.34	BQL
4-bromophenyl phenyl ether	0.34	BQL
Butylbenzylphthalate	0.34	BQL
4-Chloroaniline	0.34	BQL
4-Chloro-3-methylphenol	0.34	BQL
2-Chloronaphthalene	0.34	BQL
2-Chlorophenol	0.34	BQL
4-Chlorophenyl phenyl ether	0.34	BQL
Chrysene	0.34	BQL
Di-n-Butylphthalate	0.34	BQL
Di-n-octylphthalate	0.34	BQL
Dibenzo[a,h]anthracene	0.34	BQL
Dibenzofuran	0.34	BQL
1,2-Dichlorobenzene	0.34	BQL
1,3-Dichlorobenzene	0.34	BQL
1,4-Dichlorobenzene	0.34	BQL
3,3'-Dichlorobenzidine	0.68	BQL
2,4-Dichlorophenol	0.34	BQL
Diethylphthalate	0.34	BQL
2,4-Dimethylphenol	0.34	BQL
Dimethylphthalate	0.34	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.34	BQL
2,6-Dinitrotoluene	0.34	BQL
Fluoranthene	0.34	BQL
Fluorene	0.34	BQL
Hexachlorobenzene	0.34	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-9 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10462
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.1

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.34	BQL
Hexachlorocyclopentadiene	0.68	BQL
Hexachloroethane	0.34	BQL
Indeno(1,2,3-c,d)pyrene	0.34	BQL
Isophorone	0.34	BQL
2-Methylnaphthalene	0.34	BQL
2-Methylphenol	0.34	BQL
3- & 4-Methylphenol	0.34	BQL
N-Nitrosodi-n-propylamine	0.34	BQL
N-Nitrosodiphenylamine	0.34	BQL
Naphthalene	0.34	BQL
2-Nitroaniline	0.34	BQL
3-Nitroaniline	0.34	BQL
4-Nitroaniline	0.34	BQL
Nitrobenzene	0.34	BQL
2-Nitrophenol	0.34	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.34	BQL
Phenol	0.34	BQL
Pyrene	0.34	BQL
1,2,4-Trichlorobenzene	0.34	BQL
2,4,5-Trichlorophenol	0.34	BQL
2,4,6-Trichlorophenol	0.34	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	5.5	55
2-Fluorophenol	10	6.1	60
Nitrobenzene-d5	10	6	60
Phenol-d6	10	5.1	51
2,4,6-Tribromophenol	10	4.6	46
4-Terphenyl-d14	10	5.7	57

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-9 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10463
Lab Project ID: G128-665
Matrix: Soil %Solids: 89.3

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.35	BQL
Acenaphthylene	0.35	BQL
Anthracene	0.35	BQL
Benzo[a]anthracene	0.35	BQL
Benzo[a]pyrene	0.35	BQL
Benzo[b]fluoranthene	0.35	BQL
Benzo[g,h,i]perylene	0.35	BQL
Benzo[k]fluoranthene	0.35	BQL
Benzoic Acid	0.69	BQL
Bis(2-chloroethoxy)methane	0.35	BQL
Bis(2-chloroethyl)ether	0.35	BQL
Bis(2-chloroisopropyl)ether	0.35	BQL
Bis(2-ethylhexyl)phthalate	0.35	BQL
4-bromophenyl phenyl ether	0.35	BQL
Butylbenzylphthalate	0.35	BQL
4-Chloroaniline	0.35	BQL
4-Chloro-3-methylphenol	0.35	BQL
2-Chloronaphthalene	0.35	BQL
2-Chlorophenol	0.35	BQL
4-Chlorophenyl phenyl ether	0.35	BQL
Chrysene	0.35	BQL
Di-n-Butylphthalate	0.35	BQL
Di-n-octylphthalate	0.35	BQL
Dibenzo[a,h]anthracene	0.35	BQL
Dibenzofuran	0.35	BQL
1,2-Dichlorobenzene	0.35	BQL
1,3-Dichlorobenzene	0.35	BQL
1,4-Dichlorobenzene	0.35	BQL
3,3'-Dichlorobenzidine	0.69	BQL
2,4-Dichlorophenol	0.35	BQL
Diethylphthalate	0.35	BQL
2,4-Dimethylphenol	0.35	BQL
Dimethylphthalate	0.35	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.35	BQL
2,6-Dinitrotoluene	0.35	BQL
Fluoranthene	0.35	BQL
Fluorene	0.35	BQL
Hexachlorobenzene	0.35	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-9 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10463
Lab Project ID: G128-665
Matrix: Soil %Solids: 89.3

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.35	BQL
Hexachlorocyclopentadiene	0.69	BQL
Hexachloroethane	0.35	BQL
Indeno(1,2,3-c,d)pyrene	0.35	BQL
Isophorone	0.35	BQL
2-Methylnaphthalene	0.35	BQL
2-Methylphenol	0.35	BQL
3- & 4-Methylphenol	0.35	BQL
N-Nitrosodi-n-propylamine	0.35	BQL
N-Nitrosodiphenylamine	0.35	BQL
Naphthalene	0.35	BQL
2-Nitroaniline	0.35	BQL
3-Nitroaniline	0.35	BQL
4-Nitroaniline	0.35	BQL
Nitrobenzene	0.35	BQL
2-Nitrophenol	0.35	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.35	BQL
Phenol	0.35	BQL
Pyrene	0.35	BQL
1,2,4-Trichlorobenzene	0.35	BQL
2,4,5-Trichlorophenol	0.35	BQL
2,4,6-Trichlorophenol	0.35	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.7	77
2-Fluorophenol	10	9.1	91
Nitrobenzene-d5	10	9	90
Phenol-d6	10	7.9	79
2,4,6-Tribromophenol	10	7.5	74
4-Terphenyl-d14	10	9.3	93

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-10 (4-5)
Client Project ID: Barge Offload Area
Lab Sample ID: 10464
Lab Project ID: G128-665
Matrix: Soil %Solids: 92.9

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.33	BQL
Acenaphthylene	0.33	BQL
Anthracene	0.33	BQL
Benzo[a]anthracene	0.33	BQL
Benzo[a]pyrene	0.33	BQL
Benzo[b]fluoranthene	0.33	BQL
Benzo[g,h,i]perylene	0.33	BQL
Benzo[k]fluoranthene	0.33	BQL
Benzoic Acid	0.67	BQL
Bis(2-chloroethoxy)methane	0.33	BQL
Bis(2-chloroethyl)ether	0.33	BQL
Bis(2-chloroisopropyl)ether	0.33	BQL
Bis(2-ethylhexyl)phthalate	0.33	BQL
4-bromophenyl phenyl ether	0.33	BQL
Butylbenzylphthalate	0.33	BQL
4-Chloroaniline	0.33	BQL
4-Chloro-3-methylphenol	0.33	BQL
2-Chloronaphthalene	0.33	BQL
2-Chlorophenol	0.33	BQL
4-Chlorophenyl phenyl ether	0.33	BQL
Chrysene	0.33	BQL
Di-n-Butylphthalate	0.33	BQL
Di-n-octylphthalate	0.33	BQL
Dibenzo[a,h]anthracene	0.33	BQL
Dibenzofuran	0.33	BQL
1,2-Dichlorobenzene	0.33	BQL
1,3-Dichlorobenzene	0.33	BQL
1,4-Dichlorobenzene	0.33	BQL
3,3'-Dichlorobenzidine	0.67	BQL
2,4-Dichlorophenol	0.33	BQL
Diethylphthalate	0.33	BQL
2,4-Dimethylphenol	0.33	BQL
Dimethylphthalate	0.33	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.33	BQL
2,6-Dinitrotoluene	0.33	BQL
Fluoranthene	0.33	BQL
Fluorene	0.33	BQL
Hexachlorobenzene	0.33	BQL

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-10 (4-5)
Client Project ID: Barge Offload Area
Lab Sample ID: 10464
Lab Project ID: G128-665
Matrix: Soil %Solids: 92.9

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.33	BQL
Hexachlorocyclopentadiene	0.67	BQL
Hexachloroethane	0.33	BQL
Indeno(1,2,3-c,d)pyrene	0.33	BQL
Isophorone	0.33	BQL
2-Methylnaphthalene	0.33	BQL
2-Methylphenol	0.33	BQL
3- & 4-Methylphenol	0.33	BQL
N-Nitrosodi-n-propylamine	0.33	BQL
N-Nitrosodiphenylamine	0.33	BQL
Naphthalene	0.33	BQL
2-Nitroaniline	0.33	BQL
3-Nitroaniline	0.33	BQL
4-Nitroaniline	0.33	BQL
Nitrobenzene	0.33	BQL
2-Nitrophenol	0.33	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.33	BQL
Phenol	0.33	BQL
Pyrene	0.33	BQL
1,2,4-Trichlorobenzene	0.33	BQL
2,4,5-Trichlorophenol	0.33	BQL
2,4,6-Trichlorophenol	0.33	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9	90
2-Fluorophenol	10	10.4	104
Nitrobenzene-d5	10	10	100
Phenol-d6	10	9.3	93
2,4,6-Tribromophenol	10	9.1	91
4-Terphenyl-d14	10	10.7	107

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-10 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10465
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.3

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.34	BQL
Acenaphthylene	0.34	BQL
Anthracene	0.34	BQL
Benzo[a]anthracene	0.34	BQL
Benzo[a]pyrene	0.34	BQL
Benzo[b]fluoranthene	0.34	BQL
Benzo[g,h,i]perylene	0.34	BQL
Benzo[k]fluoranthene	0.34	BQL
Benzoic Acid	0.68	BQL
Bis(2-chloroethoxy)methane	0.34	BQL
Bis(2-chloroethyl)ether	0.34	BQL
Bis(2-chloroisopropyl)ether	0.34	BQL
Bis(2-ethylhexyl)phthalate	0.34	BQL
4-bromophenyl phenyl ether	0.34	BQL
Butylbenzylphthalate	0.34	BQL
4-Chloroaniline	0.34	BQL
4-Chloro-3-methylphenol	0.34	BQL
2-Chloronaphthalene	0.34	BQL
2-Chlorophenol	0.34	BQL
4-Chlorophenyl phenyl ether	0.34	BQL
Chrysene	0.34	BQL
Di-n-Butylphthalate	0.34	BQL
Di-n-octylphthalate	0.34	BQL
Dibenzo[a,h]anthracene	0.34	BQL
Dibenzofuran	0.34	BQL
1,2-Dichlorobenzene	0.34	BQL
1,3-Dichlorobenzene	0.34	BQL
1,4-Dichlorobenzene	0.34	BQL
3,3'-Dichlorobenzidine	0.68	BQL
2,4-Dichlorophenol	0.34	BQL
Diethylphthalate	0.34	BQL
2,4-Dimethylphenol	0.34	BQL
Dimethylphthalate	0.34	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.34	BQL
2,6-Dinitrotoluene	0.34	BQL
Fluoranthene	0.34	BQL
Fluorene	0.34	BQL
Hexachlorobenzene	0.34	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-10 (5-6)
Client Project ID: Barge Offload Area
Lab Sample ID: 10465
Lab Project ID: G128-665
Matrix: Soil %Solids: 91.3

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.34	BQL
Hexachlorocyclopentadiene	0.68	BQL
Hexachloroethane	0.34	BQL
Indeno(1,2,3-c,d)pyrene	0.34	BQL
Isophorone	0.34	BQL
2-Methylnaphthalene	0.34	BQL
2-Methylphenol	0.34	BQL
3- & 4-Methylphenol	0.34	BQL
N-Nitrosodi-n-propylamine	0.34	BQL
N-Nitrosodiphenylamine	0.34	BQL
Naphthalene	0.34	BQL
2-Nitroaniline	0.34	BQL
3-Nitroaniline	0.34	BQL
4-Nitroaniline	0.34	BQL
Nitrobenzene	0.34	BQL
2-Nitrophenol	0.34	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.34	BQL
Phenol	0.34	BQL
Pyrene	0.34	BQL
1,2,4-Trichlorobenzene	0.34	BQL
2,4,5-Trichlorophenol	0.34	BQL
2,4,6-Trichlorophenol	0.34	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.1	81
2-Fluorophenol	10	9.4	95
Nitrobenzene-d5	10	8.9	90
Phenol-d6	10	8.1	81
2,4,6-Tribromophenol	10	7.3	73
4-Terphenyl-d14	10	8.6	86

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: [signature]

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-11 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10466
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.36	BQL
Acenaphthylene	0.36	BQL
Anthracene	0.36	BQL
Benzo[a]anthracene	0.36	BQL
Benzo[a]pyrene	0.36	BQL
Benzo[b]fluoranthene	0.36	BQL
Benzo[g,h,i]perylene	0.36	BQL
Benzo[k]fluoranthene	0.36	BQL
Benzoic Acid	0.72	BQL
Bis(2-chloroethoxy)methane	0.36	BQL
Bis(2-chloroethyl)ether	0.36	BQL
Bis(2-chloroisopropyl)ether	0.36	BQL
Bis(2-ethylhexyl)phthalate	0.36	BQL
4-bromophenyl phenyl ether	0.36	BQL
Butylbenzylphthalate	0.36	BQL
4-Chloroaniline	0.36	BQL
4-Chloro-3-methylphenol	0.36	BQL
2-Chloronaphthalene	0.36	BQL
2-Chlorophenol	0.36	BQL
4-Chlorophenyl phenyl ether	0.36	BQL
Chrysene	0.36	BQL
Di-n-Butylphthalate	0.36	BQL
Di-n-octylphthalate	0.36	BQL
Dibenzo[a,h]anthracene	0.36	BQL
Dibenzofuran	0.36	BQL
1,2-Dichlorobenzene	0.36	BQL
1,3-Dichlorobenzene	0.36	BQL
1,4-Dichlorobenzene	0.36	BQL
3,3'-Dichlorobenzidine	0.72	BQL
2,4-Dichlorophenol	0.36	BQL
Diethylphthalate	0.36	BQL
2,4-Dimethylphenol	0.36	BQL
Dimethylphthalate	0.36	BQL
4,6-Dinitro-2-methylphenol	1.8	BQL
2,4-Dinitrophenol	1.8	BQL
2,4-Dinitrotoluene	0.36	BQL
2,6-Dinitrotoluene	0.36	BQL
Fluoranthene	0.36	BQL
Fluorene	0.36	BQL
Hexachlorobenzene	0.36	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-11 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10466
Lab Project ID: G128-665
Matrix: Soil %Solids: 85.7

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.36	BQL
Hexachlorocyclopentadiene	0.72	BQL
Hexachloroethane	0.36	BQL
Indeno(1,2,3-c,d)pyrene	0.36	BQL
Isophorone	0.36	BQL
2-Methylnaphthalene	0.36	BQL
2-Methylphenol	0.36	BQL
3- & 4-Methylphenol	0.36	BQL
N-Nitrosodi-n-propylamine	0.36	BQL
N-Nitrosodiphenylamine	0.36	BQL
Naphthalene	0.36	BQL
2-Nitroaniline	0.36	BQL
3-Nitroaniline	0.36	BQL
4-Nitroaniline	0.36	BQL
Nitrobenzene	0.36	BQL
2-Nitrophenol	0.36	BQL
4-Nitrophenol	1.8	BQL
Pentachlorophenol	1.8	BQL
Phenanthrene	0.36	BQL
Phenol	0.36	BQL
Pyrene	0.36	BQL
1,2,4-Trichlorobenzene	0.36	BQL
2,4,5-Trichlorophenol	0.36	BQL
2,4,6-Trichlorophenol	0.36	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.3	73
2-Fluorophenol	10	8.2	82
Nitrobenzene-d5	10	8.3	83
Phenol-d6	10	7.5	75
2,4,6-Tribromophenol	10	6.6	66
4-Terphenyl-d14	10	9.3	93

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-11 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10467
Lab Project ID: G128-665
Matrix: Soil %Solids: 83.1

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.37	BQL
Acenaphthylene	0.37	BQL
Anthracene	0.37	BQL
Benzo[a]anthracene	0.37	BQL
Benzo[a]pyrene	0.37	BQL
Benzo[b]fluoranthene	0.37	BQL
Benzo[g,h,i]perylene	0.37	BQL
Benzo[k]fluoranthene	0.37	BQL
Benzoic Acid	0.74	BQL
Bis(2-chloroethoxy)methane	0.37	BQL
Bis(2-chloroethyl)ether	0.37	BQL
Bis(2-chloroisopropyl)ether	0.37	BQL
Bis(2-ethylhexyl)phthalate	0.37	BQL
4-bromophenyl phenyl ether	0.37	BQL
Butylbenzylphthalate	0.37	BQL
4-Chloroaniline	0.37	BQL
4-Chloro-3-methylphenol	0.37	BQL
2-Chloronaphthalene	0.37	BQL
2-Chlorophenol	0.37	BQL
4-Chlorophenyl phenyl ether	0.37	BQL
Chrysene	0.37	BQL
Di-n-Butylphthalate	0.37	BQL
Di-n-octylphthalate	0.37	BQL
Dibenzo[a,h]anthracene	0.37	BQL
Dibenzofuran	0.37	BQL
1,2-Dichlorobenzene	0.37	BQL
1,3-Dichlorobenzene	0.37	BQL
1,4-Dichlorobenzene	0.37	BQL
3,3'-Dichlorobenzidine	0.74	BQL
2,4-Dichlorophenol	0.37	BQL
Diethylphthalate	0.37	BQL
2,4-Dimethylphenol	0.37	BQL
Dimethylphthalate	0.37	BQL
4,6-Dinitro-2-methylphenol	1.8	BQL
2,4-Dinitrophenol	1.8	BQL
2,4-Dinitrotoluene	0.37	BQL
2,6-Dinitrotoluene	0.37	BQL
Fluoranthene	0.37	BQL
Fluorene	0.37	BQL
Hexachlorobenzene	0.37	BQL

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-11 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10467
Lab Project ID: G128-665
Matrix: Soil %Solids: 83.1

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.37	BQL
Hexachlorocyclopentadiene	0.74	BQL
Hexachloroethane	0.37	BQL
Indeno(1,2,3-c,d)pyrene	0.37	BQL
Isophorone	0.37	BQL
2-Methylnaphthalene	0.37	BQL
2-Methylphenol	0.37	BQL
3- & 4-Methylphenol	0.37	BQL
N-Nitrosodi-n-propylamine	0.37	BQL
N-Nitrosodiphenylamine	0.37	BQL
Naphthalene	0.37	BQL
2-Nitroaniline	0.37	BQL
3-Nitroaniline	0.37	BQL
4-Nitroaniline	0.37	BQL
Nitrobenzene	0.37	BQL
2-Nitrophenol	0.37	BQL
4-Nitrophenol	1.8	BQL
Pentachlorophenol	1.8	BQL
Phenanthrene	0.37	BQL
Phenol	0.37	BQL
Pyrene	0.37	BQL
1,2,4-Trichlorobenzene	0.37	BQL
2,4,5-Trichlorophenol	0.37	BQL
2,4,6-Trichlorophenol	0.37	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.3	73
2-Fluorophenol	10	8.9	89
Nitrobenzene-d5	10	8.8	88
Phenol-d6	10	7.8	78
2,4,6-Tribromophenol	10	6.9	69
4-Terphenyl-d14	10	8.2	82

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-12 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10468
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.5

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.34	BQL
Acenaphthylene	0.34	BQL
Anthracene	0.34	BQL
Benzo[a]anthracene	0.34	BQL
Benzo[a]pyrene	0.34	BQL
Benzo[b]fluoranthene	0.34	BQL
Benzo[g,h,i]perylene	0.34	BQL
Benzo[k]fluoranthene	0.34	BQL
Benzoic Acid	0.69	BQL
Bis(2-chloroethoxy)methane	0.34	BQL
Bis(2-chloroethyl)ether	0.34	BQL
Bis(2-chloroisopropyl)ether	0.34	BQL
Bis(2-ethylhexyl)phthalate	0.34	BQL
4-bromophenyl phenyl ether	0.34	BQL
Butylbenzylphthalate	0.34	BQL
4-Chloroaniline	0.34	BQL
4-Chloro-3-methylphenol	0.34	BQL
2-Chloronaphthalene	0.34	BQL
2-Chlorophenol	0.34	BQL
4-Chlorophenyl phenyl ether	0.34	BQL
Chrysene	0.34	BQL
Di-n-Butylphthalate	0.34	BQL
Di-n-octylphthalate	0.34	BQL
Dibenzo[a,h]anthracene	0.34	BQL
Dibenzofuran	0.34	BQL
1,2-Dichlorobenzene	0.34	BQL
1,3-Dichlorobenzene	0.34	BQL
1,4-Dichlorobenzene	0.34	BQL
3,3'-Dichlorobenzidine	0.69	BQL
2,4-Dichlorophenol	0.34	BQL
Diethylphthalate	0.34	BQL
2,4-Dimethylphenol	0.34	BQL
Dimethylphthalate	0.34	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.34	BQL
2,6-Dinitrotoluene	0.34	BQL
Fluoranthene	0.34	BQL
Fluorene	0.34	BQL
Hexachlorobenzene	0.34	BQL

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-12 (2-3)
Client Project ID: Barge Offload Area
Lab Sample ID: 10468
Lab Project ID: G128-665
Matrix: Soil %Solids: 86.5

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/5/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.34	BQL
Hexachlorocyclopentadiene	0.69	BQL
Hexachloroethane	0.34	BQL
Indeno(1,2,3-c,d)pyrene	0.34	BQL
Isophorone	0.34	BQL
2-Methylnaphthalene	0.34	BQL
2-Methylphenol	0.34	BQL
3- & 4-Methylphenol	0.34	BQL
N-Nitrosodi-n-propylamine	0.34	BQL
N-Nitrosodiphenylamine	0.34	BQL
Naphthalene	0.34	BQL
2-Nitroaniline	0.34	BQL
3-Nitroaniline	0.34	BQL
4-Nitroaniline	0.34	BQL
Nitrobenzene	0.34	BQL
2-Nitrophenol	0.34	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.34	BQL
Phenol	0.34	BQL
Pyrene	0.34	BQL
1,2,4-Trichlorobenzene	0.34	BQL
2,4,5-Trichlorophenol	0.34	BQL
2,4,6-Trichlorophenol	0.34	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	7.9	79
2-Fluorophenol	10	9.2	92
Nitrobenzene-d5	10	8.9	89
Phenol-d6	10	8.1	81
2,4,6-Tribromophenol	10	7.7	77
4-Terphenyl-d14	10	8.8	88

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-12 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10469
Lab Project ID: G128-665
Matrix: Soil %Solids: 90.2

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/7/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Acenaphthene	0.33	BQL
Acenaphthylene	0.33	BQL
Anthracene	0.33	BQL
Benzo[a]anthracene	0.33	BQL
Benzo[a]pyrene	0.33	BQL
Benzo[b]fluoranthene	0.33	BQL
Benzo[g,h,i]perylene	0.33	BQL
Benzo[k]fluoranthene	0.33	BQL
Benzoic Acid	0.66	BQL
Bis(2-chloroethoxy)methane	0.33	BQL
Bis(2-chloroethyl)ether	0.33	BQL
Bis(2-chloroisopropyl)ether	0.33	BQL
Bis(2-ethylhexyl)phthalate	0.33	BQL
4-bromophenyl phenyl ether	0.33	BQL
Butylbenzylphthalate	0.33	BQL
4-Chloroaniline	0.33	BQL
4-Chloro-3-methylphenol	0.33	BQL
2-Chloronaphthalene	0.33	BQL
2-Chlorophenol	0.33	BQL
4-Chlorophenyl phenyl ether	0.33	BQL
Chrysene	0.33	BQL
Di-n-Butylphthalate	0.33	BQL
Di-n-octylphthalate	0.33	BQL
Dibenzo[a,h]anthracene	0.33	BQL
Dibenzofuran	0.33	BQL
1,2-Dichlorobenzene	0.33	BQL
1,3-Dichlorobenzene	0.33	BQL
1,4-Dichlorobenzene	0.33	BQL
3,3'-Dichlorobenzidine	0.66	BQL
2,4-Dichlorophenol	0.33	BQL
Diethylphthalate	0.33	BQL
2,4-Dimethylphenol	0.33	BQL
Dimethylphthalate	0.33	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.33	BQL
2,6-Dinitrotoluene	0.33	BQL
Fluoranthene	0.33	BQL
Fluorene	0.33	BQL
Hexachlorobenzene	0.33	BQL

Results for Semivolatiles
by GCMS 8270

Client Sample ID: SB-12 (3-4)
Client Project ID: Barge Offload Area
Lab Sample ID: 10469
Lab Project ID: G128-665
Matrix: Soil %Solids: 90.2

Date Collected: 11/28/00
Date Received: 11/29/00
Date Analyzed: 12/7/00
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/kg)	Result (mg/kg)
Hexachlorobutadiene	0.33	BQL
Hexachlorocyclopentadiene	0.66	BQL
Hexachloroethane	0.33	BQL
Indeno(1,2,3-c,d)pyrene	0.33	BQL
Isophorone	0.33	BQL
2-Methylnaphthalene	0.33	BQL
2-Methylphenol	0.33	BQL
3- & 4-Methylphenol	0.33	BQL
N-Nitrosodi-n-propylamine	0.33	BQL
N-Nitrosodiphenylamine	0.33	BQL
Naphthalene	0.33	BQL
2-Nitroaniline	0.33	BQL
3-Nitroaniline	0.33	BQL
4-Nitroaniline	0.33	BQL
Nitrobenzene	0.33	BQL
2-Nitrophenol	0.33	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.33	BQL
Phenol	0.33	BQL
Pyrene	0.33	BQL
1,2,4-Trichlorobenzene	0.33	BQL
2,4,5-Trichlorophenol	0.33	BQL
2,4,6-Trichlorophenol	0.33	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.6	96
2-Fluorophenol	10	11.1	111
Nitrobenzene-d5	10	9.9	99
Phenol-d6	10	9.5	95
2,4,6-Tribromophenol	10	8.9	89
4-Terphenyl-d14	10	9.2	92

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-8 (2-3)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	86
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	120
Surrogate % Recovery - FID	130

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10460

Reviewed By: MC

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-8 (5-6)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	86
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	120

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10461

Reviewed By: MM

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-9 (3-4)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	91
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10462

Reviewed By: MW

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-9 (5-6)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	89
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10463

Reviewed By: MA

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-10 (4-5)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	93
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10464

Reviewed By: _____

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-10 (5-6)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	91
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10465

Reviewed By: MW

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-11 (2-3)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	86
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10466

Reviewed By: WM

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-11 (3-4)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	83
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10467

Reviewed By: MW

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-12 (2-3)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	87
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10468

Reviewed By: MA

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-12 (3-4)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	90
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10469

Reviewed By: [signature]

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	Trip Blank (not on COC)
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/28/00
Date Analyzed	12/02/00
Dry Weight	100
Dilution Factor	1
C_5-C_8 Aliphatics**	< 10 (mg/Kg)
C_9-C_{12} Aliphatics**	< 10 (mg/Kg)
C_9-C_{10} Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	110
Surrogate % Recovery - FID	110

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: G128-665-10470

Reviewed By: MW

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 12/02/00 PID Initial Calibration Date: 12/02/00

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	2.4	0.12	7.5	0.38	100	10
C_9-C_{12} Aliphatics	1.3	0.065	4.0	0.21	100	10
C_9-C_{10} Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD or CCC	Method of Quantitation
C_5-C_8 Aliphatics	40	2	15.5	Calibration Factor
	160	8		
	400	20		
	1600	80		
	4000	200		
C_9-C_{12} Aliphatics	30	1.5	18.8	Calibration Factor
	120	6		
	300	15		
	1200	60		
	3000	150		
C_9-C_{10} Aromatics	65	3.25	21.4	Calibration Factor
	260	13		
	650	32.5		
	2600	130		
	6500	325		

Calibration Check Date: 12/02/00

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	RPD
C_5-C_8 Aliphatics	160	8	-2.2
C_9-C_{12} Aliphatics	120	6	2.9
C_9-C_{10} Aromatics	260	13	-19.7

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Reviewed By: mn

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-8 (2-3)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	86.2
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	97
Aromatic Surrogate % Recovery	100

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-665-10460

Reviewed By: JWS

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-8 (5-6)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	85.7
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	91
Aromatic Surrogate % Recovery	93

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-665-10461

Reviewed By: mm

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-9 (3-4)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	91.1
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	95
Aromatic Surrogate % Recovery	98

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-665-10462

Reviewed By: [signature]

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-9 (5-6)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	89.3
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-665-10463

Reviewed By: MA

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-10 (4-5)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	92.9
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-665-10464

Reviewed By: MA

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-10 (5-6)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	91.3
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-665-10465

Reviewed By: WW

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-11 (2-3)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	85.7
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-665-10466

Reviewed By: WW

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-11 (3-4)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	83.1
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	99
Aromatic Surrogate % Recovery	100

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-665-10467

Reviewed By: _____

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-12 (2-3)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	86.5
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-665-10468

Reviewed By: MM

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: Barge Offload Area

Sample Information and Analytical Results	
Sample Identification	SB-12 (3-4)
Sample Matrix	Soil
Date Collected	11/28/00
Date Received	11/29/00
Date Extracted	11/30/00
Date Analyzed	12/05/00
Dry Weight	90.2
Dilution Factor	1
C_9-C_{18} Aliphatics*	< 10 (mg/Kg)
C_{19}-C_{36} Aliphatics*	< 10 (mg/Kg)
C_{11}-C_{22} Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.
Sample did not require fractionation.

Lab info: G128-665-10469

Reviewed By: YW~

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 10/16/00

Calibration Ranges and Limits

Range	MDL (µg/L)	MDL (mg/Kg)	ML (µg/L)	ML (mg/Kg)	RL (µg/L)	RL (mg/Kg)
C_9-C_{18} Aliphatics	0.1	2	0.3	6.5	100	10
C_{19}-C_{36} Aliphatics	0.1	1	0.3	3.1	100	10
C_{11}-C_{22} Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	Levels (mg/Kg)	%RSD or CCC	Method of Quantitation
C_9-C_{18} Aliphatics	0.06	1	3.60	Calibration Factor
	0.15	2.5		
	0.3	5		
	0.6	10		
	1.2	20		
C_{19}-C_{36} Aliphatics	0.08	1.33	2.3	Calibration Factor
	0.2	3.33		
	0.4	6.67		
	0.8	13.3		
	1.6	26.7		
C_{11}-C_{22} Aromatics	0.12	2	3.7	Calibration Factor
	0.3	5		
	0.6	10		
	1.2	20		
	2.4	40		

Calibration Check Date: 12/05/00

Calibration Check

Range	Levels (µg/mL)	Levels (mg/Kg)	RPD
C_9-C_{18} Aliphatics	0.6	10	-2.4
C_{19}-C_{36} Aliphatics	0.8	13.3	-11.7
C_{11}-C_{22} Aromatics	1.2	20	-3.8

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit
RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-8 (2-3)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10460	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	86.2
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.0	5030/8015B	1.0	11/1/00
Diesel Range Organics	BQL	7.2	3550/8015B	1.0	11/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By: _____

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-8 (2-3)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10460	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	86.2
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.0	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	7.2	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-8 (5-6)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10461	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	85.7
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.0	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	7.3	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-9 (3-4)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10462	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	91.1
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.6	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	6.8	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

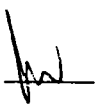
Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-9 (5-6)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10463	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	89.3
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.7	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	6.9	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-10 (4-5)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10464	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	92.9
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.4	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	6.7	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-10 (5-6)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10465	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	91.3
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.6	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	6.8	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-11 (2-3)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10466	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	85.7
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.0	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	7.2	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-11 (3-4)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10467	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	83.1
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.2	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	7.4	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-12 (2-3)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10468	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	86.5
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.9	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	6.9	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Total Petroleum Hydrocarbons
by GC 8015B

Client Sample ID:	SB-12 (3-4)	Date Collected:	11/28/00
Client Project ID:	Barge Offload Area	Date Received:	11/29/00
Lab Sample ID:	10469	Analyzed By:	BMS
Lab Project ID:	G128-665	%Solids:	90.2
Matrix:	Soil		

Compound	Result (MG/KG)	Quantitation Limit	Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.6	5030/8015B	1.0	12/1/00
Diesel Range Organics	BQL	6.7	3550/8015B	1.0	12/4/00

Comments:

Quantitation Limits are fully calculated using dilution factors and % solids.
BQL = Undetected or below quantitation limit.

PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway SE, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 20560

Page 1 of 1

Client: CATLIN
Address: 220 OLD DAIRY RD
Address: WILM, NC 28409
Quote #: 1489

Project ID: BALLAST OFFLOAD AREA
Contact: TOM LANDIS
Phone: 452-5861
Fax: 452-7563

Date: 11/29/00
Turnaround: STD 5 day rush
Job Number: 950950
P.O. Number: 20129-2

Report To: TOM LANDIS
Invoice To: CATLIN

Sample ID	Date	Time	Matrix	Preservatives: ICE	MEOH			Analyses: 5030/8350	8260	8270	VPH	EPH						Comments: Please specify any special reporting requirements
SB-8 (2-3)	11/28/00	1215	SC ~~Soil~~	+	+			+	+	+	+	+						G128-665
SB-8 (5-6)	11/28/00	1225		+	+			+	+	+	+	+						EDD FORMAT
SB-9 (3-4)	11/29/00	845		+	+			+	+	+	+	+						
SB-9 (5-6)	11/28/00	1255		+	+			+	+	+	+	+						
SB-10 (4-5)	11/29/00	915		+	+			+	+	+	+	+						
SB-10 (5-6)	11/28/00	1330		+	+			+	+	+	+	+						
SB-11 (2-3)	11/29/00	945		+	+			+	+	+	+	+						
SB-11 (3-4)	11/28/00	1445		+	+			+	+	+	+	+						
SB-12 (2-3)	11/29/00	1015		+	+			+	+	+	+	+						
SB-12 (3-4)	11/28/00	1515	↓	+	+			+	+	+	+	+						

Relinquished By	Date	Time	Received By	Date	Time	Temperature
Gabriel Caselle	11/29/00	1135	Gabriel Caselle	11/29/00	1135	ON ICE

State Certification Requested
NC + SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS